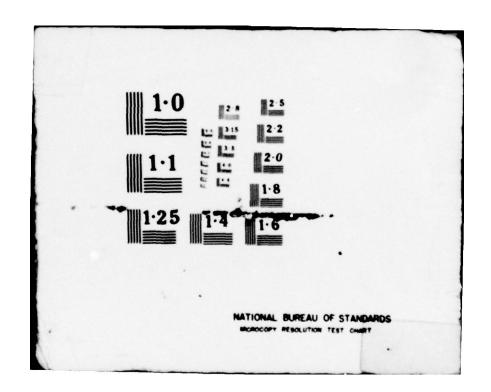
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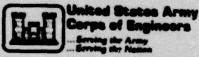


RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

EXISTING LOCKS AND DAM NO. 26 MISSISSIPPI RIVER, ALTON, ILLINOIS

DA076094

Prepared for



St. Louis District

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Woodward-Clyde Consultants
Chicago, Illinois

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VOLUME IIIA

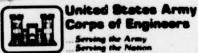
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Volume IIIA. Appendices H through T.

Chase It Report . / Prepared for



St. Louis District

D. Michael /Holloway

Jean-Yves Perez

Woodward-Clyde Consultants

Chicago, Illinois

15 Jul 1979

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Vol I Overview of Poundation Investigation and Test Program
Vol II Impulse and Interpretation of Chemical Growting Test Program
Vol III Appendices A through G, Results and Interpretation of Chemical Growting Test Program
Vol III Impulse and Interpretation of Pile Driving Effects Test Program
Vol IVI Appendices Ethrough T, Results and Interpretation of Pile Driving Effects Test Program
Vol IVI Appendices A through E, Results and Interpretation of Drilled-In Pile Test Program
Vol Vol IVI Appendices A through E, Results and Interpretation of Drilled-In Pile Test Program
Vol Vol Appendices A through E, Results and Interpretation of Back Anchor Test Program
Inch Accher Test Program
Inch December 2 and Identify by Mech Number)

19. KEY WORDS (Continue on reverse side if necessary and identify by block member)

Timber piles Lock and Dam No. 26, Mississippi River Alluvial sands Chemical grout test Benoto method Rock anchor test

Instrumentation of tests Drilled-in pile test Pile driving effects test Vibrational effects on structures

ABSTRACT (Continue on reverse side II necessary and identify by block number) A series of tests examining various foundation systems and construction techniques were conducted on Ellis Island near Locks and Dam No. 26 in alluvial sand deposits underlain by glacial deposits and limestone. The chemical grout test consisted of grouting the upper 20 feet of the alluvial sand by injecting a number of different silicate and cement-bentonite grout types, while varying the grouting method, hole spacing, and injecting rates. Heave, lateral displacement, and pore pressure were monitored during grout injection. The in

situ properties of the sand were measured before and after grouting by standard

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18. SUPPLEMENTARY NOTES

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20. penetration tests, static cone penetration tests, pressuremeter tests, bore hole permeability tests, and shear wave velocity tests. Concurrently laboratory tests were conducted to investigate the strength and creep behavior of the grouted sand. After completion of grouting, the site was excavated to examine and evaluate the grouted sand. In the rock anchor test, inclined rock anchors were installed in limestone through 130 feet of alluvial and glacial deposits using a pneumatic down-the-hole harmer with an offset reamer. Load tests were conducted on three instrumentated rock anchors and the feasibility of installation of the rock anchors was determined by evaluating loss of ground during installation, performance of the installation equipment, and rate of installation. The drilled-in pile test consisted of installation of large diameter high capacity pipe piles by the Benoto method. The feasibility of installing these piles was determined by evaluating loss of ground during installation, performance of the Benoto equipment, and rate of installation. In the pile driving effects test, pile founded monoliths were constructed, supported on either one, eight or twelve timber piles jetted and driven in alluvial sand to a depth of 35 feet. After applying lateral and vertical load to the monoliths, steel piles were driven at varying distances from the monoliths while monitoring movement of the monolith and supporting piles, shear, moment, and axial load in the timber piles; and pore pressure, movement, and particle velocity, in the soil. Parameters examined were pile type being driven (sheet, pipe, or H-pile), pile driving hammer (diesel, air-steam, or vibratory), distance of driven piles from monolith, driving of multiple piles at the same distance from the monolith, load level applied to the monolith, and soil

properties (grouted and ungrouted). Vertical and lateral load tests were conducted on each pile founded monolith. Tests were also conducted to assess what effect grouted soil has on piles. Piles were driven in both grouted and ungrouted sand to examine driving characteristics and lateral load tests were con-

ducted on H and pipe piles in both grouted and ungrouted sand.

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

VOLUME IIIA

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Appendix K	TEST AREA SUBSURFACE CONDITIONS
Appendix L	MEASUREMENT DETAILS, MONOLITH M1
Appendix M	MEASUREMENT DETAILS, MONOLITH M2
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Appendix Q	MEASUREMENT DETAILS, MONOLITHS M4 AND M8
Appendix R	DETAILED ANALYSIS OF MONOLITH M2
Appendix S	DETAILS OF LOAD TESTED PROTOTYPE PILES
Appendix T	DETAILS OF ANALYSIS OF MONOLITH-PILE-SOIL LOAD TRANSFER

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RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

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PREDICTED PERFORMANCE

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YTC825 Phase II, Vol III A

H.1 Backup for fig. 2.6, Volume III

Data from Lo (1977)

Blowcount	Reference Velocity	Rate	Rater hommer Energy Eram, ft-16			
ben 1ft	V ₁ in./s	2 6yro 0	32,500	42,000		
5	-	2.7	4.5	8.1		
10	-	3.7	6.5	11.4		
20	-	5.3	9.1	16.1		
30	-	6.3	11-1	19.5		
50	-	8.1	14	25		
100		11.5	19.9	26		

H.2 Backup for fig. 2.7. Volume III

Fig. 2.7, Volume III is based on data collected by Fragin (1936) at Dam No. 11, for moneliths 2 and 3. The data are presented in the following tables. Values in parentheses are normalized values of displacement (SH), o for 10 hammes blows with respect to values of (SH), at r=10ft.

MONDLITH Z (BH)10

	DISTANCE (ft)	- 10	20	50	100	_
LATERAL	2.5	0.0149	0.0095	0.0015		0
t/pile	3.5	0.021	0.011	0.002		Δ
	4.5	(1.0) 0.0ZZ	0.013	0.0013	0.0005	
	6.5	(1.0) a0295 (1.0)	(0.591) 0.015 (0.509)	(0.059) 0.0010 (0.054)	(0,023)	0

MONOUTH 3

_		10	20	50	100	_
	2.5	0.0052	0.00 19	0.0004	0.0004	•
		(1.0)	(0.365)	(0.077)	(0.077)	
LATERAL	3.5	0.0065	0.00 37	0.0009	0.0003	A
LOAD		(1.0)	(0.569)	(0.139)	(0.046)	
t/pile	4.5	0.0085	0.0033	0.0012	0.0008	
		(1.0)	(0.388)	(0.141)	(0.094)	
	6.5	00195	0.0059	0.0025	0.0014	•
		(1.0)	(a 303)	(0.128)	(0.072)	-

REAGIN'S DATA (THESE VALUES WERE READORF FROM FIGURES)

44 DATA NORMALIZED WITH RESPECT TO THE VALUE AT 10 ft.

H.3 Backup for fig. 2.8, Volume III

V = V, \[= ap [-0.00(r-1)] (eq 2.2, Volume III)

Assuming V, = 2.5 in. |c for feagin's (1906) test

(feagin used a Vulcan I hammer, Eram: 15,000 ft-b) (blowcount was probably be 60 blowlft on the band of wave equation analysis of timber pile driving).

1. 10 ft: V = 2.5 \(\frac{1}{10}\) exp [-0.03 (10-1)]
= 0.604 in.16

Q r. 20 ft: $V = 2.5 \sqrt{\frac{1}{20}} \exp \left[-0.05(20-1)\right]$ = 0.316 in. 15

Thus, from fig. 2.7 (Volum III) and Section H.2 (Volum III A):
(Feagin's moments 2)

Lateral	T=10	oft_	r= 20 ft		
lateral Load t/pila	(84),0	in./in./s	(8H).0	Su/v in./in.ls	
2.5	0.0149	0.025	2000.0	0.03	
3.5	0.021	0.035	0.011	0.035	
4.5	0. 0 22	0.036	0.013	0.041	
6.5	0.0295	0.044	0.015	0.047	

H. A Backup for fig. 2.12, Volum III

Values of reference velocity V, and values of velocity V at distance r can be obtained for the following condition:

Vulcan 010 hammer of B = 10 blowlft (Eram: 32,500 ft.16) B = 60 blowlft

Dilmag D22.02

Eram: 25,000 ft.16 @ 0:10 blow ft

Eram: 39.780 ft.16 @ 0:50 blow ft

using fig. 2.6 and eq 2.2 (Volume III):

B Vulcan 010 Delma g D22-02

blowlft V1, in.15

10

6

3.3

13.5

24

then from V = V, V = exp[0.03(1-1)], fig 2.12 can be obtained.

YTCB25 Phon IV; Vol III A

H.S Backup For fig. 2.9 and 2.10 Volume III

from fig. 2.12 and fig. 2.8 (Volume III):

H. = 4 t | pile: \[
\frac{\delta + 0.0007 \frac{\in./10bloors}{\in/5} \righta = 0.046 \frac{\in./10bloors}{\in./5} \righta = 0.068 \frac{\in./10bloors}{\in./5} \righta = 0.068 \frac{\in./10bloors}{\in./10bloors} \righta = 0.068 \frac{\in./10bloor

Same procedure was followed for the other cases.

H.6 Backup for fig. 2.11, Volume III

fig. 2.11 was developed from woulds of wave
epakin analyses using the programs WEAP and PSI
Summary of results (WEAP):

			- Tan		
Depth of	Rut	Q.	Q,	£max	Blowant)
1+	ŧ	Ł	<u>t</u>	ft-k	blow/ft
16	34.5	7.4	26.6	21.9	3
- 1	61	1	191	23	5
	104		101-1	23	10
	198		190.1	22.1	24
	388	1	380.1	20.5	825
1					
રેડ	106	44.5	61.5	22.9	10
1	ורו	1	126.6	22.5	18
	298		2535	21.3	87
	320		2)5.5	20.9	်၊၀န
1	266	+	221.5	18	20
60	237.5	130.6	106.4	22.8	36
	344		213.4	21.1	141
1	557	1	426.4	18.2	æ

Vulcan 010- HP 14x72

470815					· H-7
Phane IV; Val III A		(WEAP)		,	
Depth of Pile Tip	Rut	95 E	Q,	Emax fr. h	blowarnt B Wowlft
15	25.5	4.6	209	14.7	3
	46.S 84		41.9	22.4	7
	2.621 2.508	1	148.9	18.5	14
રુડ	72.5	23.9	48.6	22.7	7
	123.5		94.6 144.1	22.6	13 S2
	260		236.1	20.5	88
	280 300		276.1	20.4 18.4	119
+	432		408.1	15.6	00
60	155.5 239	71.5	167.5	21.6	18
	250 275		178.5	20.5	72
	900		228.5	20.5	177
•	406	•	324.5	15.9	a)

SUMMARY OF PSI PROGRAM RESULTS

Depth of Pile Tip	Rut	Q,	Q,	fmax	Blowount	
1+	<u>t</u>	Ł	t	fe-k	phulft	
15	63.2	102	53	N/A	4	
1	116.2	1	106	N/A	9	Vulcan
36	111.3	49.3	62	NIA	8	010
	173.3		121		21	•
•	294.3	1	250	1	56	7
60	156.5	106.5	So	N/A	12	SCX TI
	2065		100		16	
ţ	306.5	1	200	1	اره)

H.7 Backup for fig. 2.13, Volume III Detailed backup Calculations are in Appundix D, Phose II Report, Project files. Results are based on WEAP analyses and parameters presented in Section 2.2.8, Wolume III. Summary of results fillows:

101	HP		. 7	2
(4)	HE	14	7	

	Unoxouted Soil		Grouled Snil	
Depth of Pile Tip ft	bloofft	Wmax k/inc	Blowcount Blowlft	Tmax k/in2
S	1	23	3	23
10	4	23	9	23.5
ıs	6	23	12	23.5
20	8	23	15	24
25	п	23	п	23

(b) PP 14 x 0.375

5	1	24.5	5	25
10	2	245	7	25
IS	4	25	9	25.5
20	6	25	11	25.5
25	7	25	1	25

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H. 8 Backup for fig. 2.14, Volume III

Backup for fig. 2.14 is provided in Appendix D, Table D.2 and fig. D.s through D.10, Phase II Report, Project Files.

PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDIX I
DISTRUMENTATION DETAILS

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I INSTANTANTON LETA 3

I.I DETAILED DESCRIPTION OF CYBER I

1.1.1 Sec. 0

Multichannel Computer-Based Scanner/Recorder. Cyber II for data acquisition is a microcomputer system designed and programmed to automatically condition and acquire data from strain gages and other voltage or bridge-type transducers. The system may be operated by personnel not necessarily knowledgeable in computer operation and programming. The Cyber II is preprogrammed before delivery so that only setup information is entered to control the acquisition and recording of test data. All the information to the system may be entered via a key-based pad and display panel. The key base consists of numerical keys and command word keys.

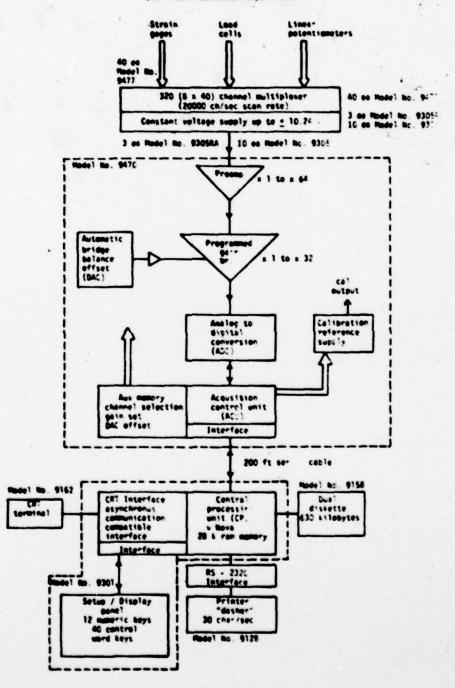
The Cyber II has basically three separate modes of operation; setup, acquisition and playback. In the setup mode, the system reads the instructions as entered by the operator. In the acquisition mode, any selected channel can be monitored on the display panel. The other channels may be scanned at a maximum rate of 20,000 channels per second. The data are stored in the computer memory for later transfer to disk (dual floppy) storage and selective printing. For the playback mode the stored data may be recalled for inspection, further processing to engineering units and analytical studies by programming the computer.

The Pile Driving Effects Test requires that several hundred gages be read expediently for a very large number of test load steps. This large volume of data requires efficient reduction to engineering units and analysis. The multichannel data acquisition system selected (Cyber II) is 320 channels.

Intergrated in this system is a CRT terminal with an appropriate software package so that the test data may be inspected and partially evaluated before the data are stored on a dual floppy disk unit. The data stored on the disks may then be played back onto computer tape and entered into an outside computer with an appropriate processing program. This program will be tailor-made for the particular task to optimize the utilization of the test data through expedient data reduction and presentation.

I.1.2 Multichannel Data Acquisition System Schematic

(50 ft milliconductor input coble)



I.l. 3 Multichary Data temperatur Sycien Componeris

ACQUISITION CONTROL UNIT

The Acquisition Control Unit offers several features which are designed to optimize the use of the CPU bandwidth and offer greater precision in sample time. The reason the microcomputer based system is able to provide operation at speeds comparable to the minicomputer is the use of this unique CYBER controller.

ANALOG-TO-DIGITAL CONVERTER

The Basic Acquisition Unit is equipped with a successive approximation analog-to-digital converter. The successive approximation ADC utilizes a sample and hold amplifier to sample the incoming data and hold this value while the ADC is performing the conversion. The unit is supplied as 11 bits plus sign as standard, and with speed ranges of 40 000 to 100 000 conversions per second.

PROGRAMMED GAIN AMPLIFIER

The input signal path consists of two preamplifiers followed by a programmable gain amplifier. The Basic Acquisition Unit is equipped with a programmed gain amplifier that provides full-scale input ranges of ±5 my through 10 24V full-scale in 12 binary steps.

CALIERATIO:

All systems are equipped with a programmable calibration reference supply to provide the system with an NBS traceable standard. The reference supply will output under computer control a DC voltage which is ±80% of each full-scale input range of the system.

Since values obtained from the calibration are used to correct all other data, it is desirable to read them with greater precision than normal data. Therefore, each data point taken during calibration is measured 16 times, and this data averaged to minimize the effects of system noise.

AUTOMATIC BRIDGE BALANCE

In systems having a number of bridge type channels, an automatic bridge balancing network provides much faster setup and greater flexibility to the user. In the CYBER SYSTEMS approach, a balance voltage is induced ahead of the programmed gain amplifier. The system first makes a tare run to measure the offset. Then, when measuring the signal, a compensating offset value is loaded via the controller into the DAC and the signal measured on a higher gain range.

AUTGMATIC RANGING

The system employs an automatic ranging feature that automatically selects the correct amplifier gain range for each measured channel. The system is set to maintain the signal level nominally between 40 and 80% of full-scale, except on the highest and lowest gain ranges.

1

AUXILIARY MEMORY

The controller contains an auxiliary memory (external to the computer memory) that is used to hold the channel sequence, the gain settings, and DAC offset values for automatic bridge balancing. This data is loaded automatically prior to the start of acquisition. During acquisition, the channel information is transferred to the front end equipment without further computer intervention. Only the incoming ADC data is transferred into the computer memory via the direct memory access channel. By eliminating the need to obtain the scanning information from the CPU memory, the data I/O loaded on the CPU is reduced by 66 percent.

REAL-TIME CLOCK

The controller also contains a programmable real-time clock which provides the timing for both channel-to-channel sampling rate and the time interval between scans.

PROGRAMMABLE SAMPLE RATE AND INTERVAL

The programmed sample rate allows the system to be tailored to the specific information bandwidth and recording capability of the application. The maximum sampling rate for low level signals is 20,000 channels per second and is program selectable downward by factors of two (i.e., 10,000 to 5,000, etc.) The interval between scans can vary from 10 milliseconds to 10 minutes.

PROGRAM SELECTABLE BANDWIDTH

The amplifiers and the offset DAC are wideband to minimize settling errors when the system is operated at high throughput rates. This system includes provisions for the selection of a HIGH/LOW amplifier bandwidth. This feature, used in conjunction with the programmable sample rate, allows the limiting of the noise bandwidth when permitted by the slower scan rates.

ANALOG-TO-DIGITAL ISOLATION

The controller is the place where the analog and digital grounds of the system are isolated to minimize the possibility of digital noise affecting the accuracy of the acquired signal.

The entire multiplexing, amplification and A-to-D conversion circuitry operates on a separate power supply and the signal information is transmitted serially over optical links. Besides providing the analog-to-digital isolation, this design allows the further benefit of remote operation of the analog equipment with a minimum of interface lines with all information transmitted digitally.

Further, the isolation allows several hundred volts of common mode voltage to exist between the analog and digital grounds. This is especially important when distances of hundreds of feet in an uncontrolled environment exist between the cluster of transducers to be measured and the digital system.

MODEL 9305 EXCITATION POWER SUPPLY

The Model 9305 Excitation Power Supply is a self-contained unit specifically designed for use with Strain Gauges. Load Cells. Pressure Transducers. Displacement Transducers and virtually all types of units requiring constant voltage excitation.

The output is continuously adjustable from 0 to 12 volts and a single power supply can operate up to 32 350-ohm bridges at full output voltage.

MODEL 9477 SIGNAL CONDITIONER/MULTIPLEXER

The Signal Conditioner/Multiplexer card provides conditioning for any combination of 1, 2, or 4-arm bridges and has provisions for completion networks, automatic resistance calibration, excitation power distribution and an 8-channel, 3-wire, low-level multiplexer. Input termination is by quick disconnect card edge connectors. Each transducer is provided with a 6-wire plus shield interface allowing high transducer accuracy by remote connection to the bridge.

The signal conditioning/multiplexer card contains provision for a single pole R-C filter per channel.

Twenty-four (24) channels (3 cards) may be contained in the main CYBER II chassis for small requirements. Up to sixteen cards, 128 channels are housed in each separate multiplexer chassis. A buss type addressing structure allows the system to support over 1000 channels through the use of additional chassis and plug-in cards.

SOFTWARE

CYBER II is provided as a complete turn-key system including all the software required for many applications. In addition, the system provides the flexibility to be easily tailored to meet a variety of non-standard applications. The basic system includes three (3) main programs. These are:

- Setup for acquiring data
- · Acquisition and recording of data
- · Playback of the previously recorded data

In the Setup mode, the operator inputs free form statements which supply setup parameters. It is possible to enter all the information to the system via the integral Setup and Display Panel. The Setup and Display Panel consists of a numerical keypad, a command keypad and a display. In the Setup Mode the system reads the instructions as entered by the operator and echos them on the display output. In the Display Mode any selected channel may be monitored during acquisition.

When used as a satellite to a host system all the setup information may be transmitted from the host to the CYBER II system allowing completely unattended operation. Interfacing to the host system is via an RS-232 port which allows the selection of virtually any host computer. The Setup and Display Panel may still be utilized when connected to a host system for maintenance and setup procedures.

Prior to the start of acquisition the system has provisions for automatic calibration and tare offset compensation. During acquisition, calibrations may be scheduled.

Also during acquisition, the system will limit check any previously specified channels and output up to 24 channels in engineering units for test monitoring purposes.

In the playback made of operation, the system accesses the previously recorded data, applies the scale factors and calibration data as previously defined, and outputs the information to a selected device. The user may specify various non-linear transformations to be applied to the data in performing the conversion to engineering units.

Additional information concerning the software available with CYBER II is contained in the User Manual.

*

8

I.I.4 Multichannel Data Acquisition System Specifications

SYSTEM SPECIFICATIONS

Number of Inputs:

8 channels per card, 24 channels

in main chassis

128 channels in each expansion

chassis

1024 channels maximum

Input Type

Guarded Differentia'. 3-wire

MOS switch, fully protected

Input Range

= 5 millivolts to = 10 24 volts in 12

binary ranges

Common Mode Voltage

± 10 volts between channels

2 200 volts between all channels

and digital ground

Conditioning

Each channel includes provisions for 1, 2 or 4-arm bridge completion and resistance calibration, 6-wire mout plus shield Single-boile low

pass liner

Offset

= 80 millivolts unbalance compen-

sation

Resolution = 40 microvolts Stability : 1 microvoft & zero

Scanning Rate

Programmable, binary steps from approximately 40 SPS to 40,000 SPS (20,000 SPS on low level

signals)

Interval between Scans

Programmable 10 milliseconds to 650 seconds

Programmable

Filter Amplifier

High/Low Range 2-pole Active 60 kHz Wideband

3 kHz Lowband

Calibration

Voltage programmable

2 4 milirolts to 28 192 volts in 12 binary ranges Accuracy = 0 015%

of range = 3 microvorts

Bridge Programmable single-

point shunt resistor

Excitation Power Supply

Adjustable 0 to 12 vons

- I.2 DESCRIPTION OF DYNAMIC DATA ACQUISITION SYSTEM
- I2.1 General. The description of the dynamic data acquintion system is shown in Fig. I.1.

 A typical geophone and a schematic of the 3-D geophone arrangement is given in Fig. I.2.
- 122 Geophone Data: Analog to Digital Conversion

During Pule Driving Effects Test Program, 16 tracks of voltage vs time were recorded directly and continuously on analog magnetic tape using multi-channel tape recorders.

Selected tape data were played into an analog to digital conversion system and digitized for further evaluation using computer facilities. Most of the digitizing of these tapes was accomplished in the field using a Biomation TRANSIENT RECORDER (MODEL 1015) unit with an oscilloscope, a magnetic computer tape recorder (CYPHER) and an interface unit.

13 DETAILED DESCRIPTION OF THE

PILE DRIVING ANALYZER SYSTEM

1.3. Measured Parameters

Dynamic measurements of strain and acceleration are made on piles near the butt during driving.

1 3 2 System Description

- 1.2.3.1 General. The Pile Driving Analyzer System is rented and consists of:
 - set of two strain and two acceleration transducers mounted near the pile butt;
 - (2) field analog computer (Pile Driving Analyzer);
 - (3) two channel storage oscilloscope with mounted camera system;
 - (4) four-channel (analog) magnetic tape recorder; and
 - (5) pressure transducer (for monitoring combustion behavior of diesel hammers).
- T.3.1.9 Principle of Operation. Pile acceleration and strain are measured near the top of the pile for each hammer blow. By inputting these measured quantities along with material properties and boundary conditions of the hammer-pile-soil system, the analyzer unit computes stress, velocity, transmitted energy, acceleration, and penetration resistance using a wave equation computer program.

1.3.3 Instrumentation System Specifications

1.3.3.1 Accelerometer.

Piezoelectric at 5 mv/g sensitivity; 1000 g range (Pile Dynamics, Inc).

1.33.2 Strain Transducer.

350 ohm full Wheatstone bridge; approximately 1% strain range (Pile Dynamics, Inc).

1.3.3.3 Connecting Cable.

10 conductor stranded wire; shielded in pairs.

1.3.54 Analyzer Unit.

(1) Type or Model No:

Pile Dynamics, Inc Model EB, 3.5 digit LED panel displays one parameter, digital line printer for three selected peak quantities, analog output for seven different parameters; 200 mg. 200 mg. (2) Size: 16-3/4 in. by 18-1/2 in. by 7-1/4 in.

40 1b

(3) Weight:

(4) Power Requirement: 115 V, ±10%, 48-66 Hz

(5) Temperature Ranges:

Operation: 10°C to 45°C

Printer: 0°C to 40°C

Storage: -50°C to +85°C

(6) Input Impedance: Greater than 10 k ohms;

(7) Output Impedance: Less than 10 ohms with 7 ma.

1.3.3.5 Portable Oscilloscope.

(1) Type or Model No: Tektronix 314, two-channel storage oscilloscope

(2) Size: 4.4 in. by 9.3 in. by 13.6 in.

(3) Weight: 10.5 1b

(4) Power Requirement: AC (90 V to 132 V or 180 V to 264 V at 48 Hz to 490 Hz

with maximum power 29 W at 115 V); DC (11 V to 14 V or 22 V to 28 V with maximum current, 16. A at 12 V)

(5) Temperature Range:

Operating, -15°C to +55°C

(6) Sensitivity:

1 mV/div at 10 MHz

(7) Integrate Mode:

Intensified signal for fastrise-time low repetition rate signals using autotrigger and auto-erase (displays one- or twochannel signal for each blow with manual override to store one particular event)

1.3.4.6 Camera.

(1) Type or Model No:

Tektronix C-30A scopemounted camera with Polaroid film pack

(2) Tape Recorder:

Tanberg Instrumentation (4channel) Tape Recorder Series 115 1707' Fine 7 Vol 1 1

1.2. Installation Procedures

Typical transducer mounting detail schematics for the timber piles, steel H piles, and steel pipe piles are given in Fig. 1.40. The transducers are bolted to the pile in predrilled holes after the pile is suspended in the leads. Wires from each transducer are collected nearby in a cable box with a single, multiwire, shielded cable transmitting the signals to the Pile Driving Analyzer. Individual cables output the selected analog signals to both the oscilloscope and the tape recorder from the Pile Driving Analyzer, see Fig. 1.4 b.

1.3.5 Data Acquisition

The measured quantities (strain and acceleration records) are simultaneously recorded on both the oscilloscope and the tape recorder through the field computer. The field computer outputs include: digital (paper tape) printout of peak values of measured/computed parameters (acceleration, force from strain, velocity, penetration resistance, and energy transmitted to the pile); and analog records of acceleration, velocity, force, energy, and/or pressure for visual display (oscilloscope) or permanent storage (on magnetic tape). Figure 1.4 b shows the schematic diagram of Pile Driving Analyzer System typically used during pile driving in the field. Magnetic (analog) tape recordings are used as input data for further analyses in the office, with the component arrangement shown in Fig. 1.4c.

HOMEAMETT

LIGHT BEAM RECORDER (OSCILLOGRAPH)

Mode1

1855 with 1893-MPD modules

Channels Paper Width 18 6 in.

Frequency Response

5 IDE

Chart Speeds

0.1 - 120 in./s

Power Source

110 Y AC

-PEAK VIBRATION MONITOR

Specifications - Sinco model 5-4

frequency Response:

Natural frequency of detector is 8 Hz Flat within + 10% in terms of particle velocity from about 10 Hz to 150 Hz

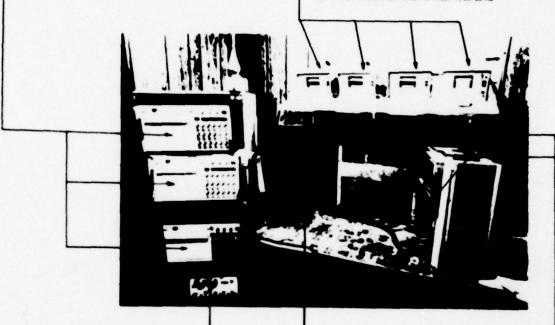
Sonothisty Ranges: 86. 1, 2, 5, 14, 24, 64. 164. 258 invest. Full State

Trigger Level S. 10, 20, 20, 40, 60, 60, 70, 60, 600 Full Syste

AD Infoc (S. 1.2 Pangos) AD Infoc (S. 1.2 2 Pangos) At Infoc (S. 10.20 Rangos)

Byslem Assuracy: 1 10% of Reading 1.2% full books at 20 Mg

Posts Requirements: 30 worte, 115 V/230 V, 60/60 Mz



Function Generator

Junction Box

output

Appe Seconder Output

5-4 output HEILETT PACKARD
FIT MAGNETIC TAPE RECORDER

Rode 1

30444

Channels

•

Tape Size Reel Size 1/4 ta.

Tape Speeds

7 ta.

Parer Source

5/12-15 ta./s

PHE PRIVING EFFECTS TEST DEDGEMAN DESCRIPTION OF DYNAMIC DATA ACQUISITION SYSTEM.

6 manufacture

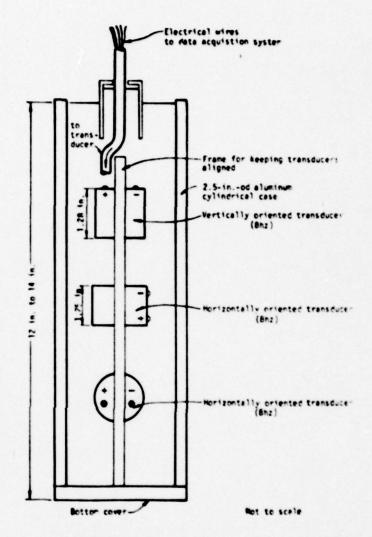
Fig. I



L-15 Besic unit (actual size)

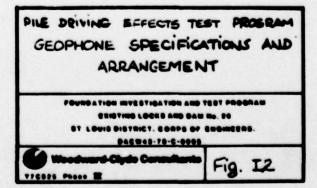
GENERAL SPECIFICATIONS

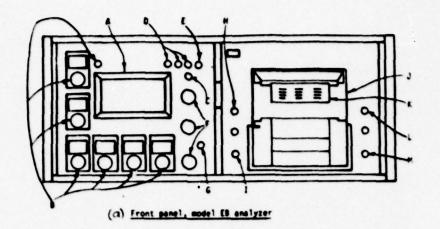
Distortion Less than 0.2% @ 12 Hz with velocity of 0.7 in./sec. p-p Standard frequency range ... 4.5 to 40 Hz Frequency tolerance ... 24.38.60, 95.150. 240, 380.600, 960 ohms Case to coil motion ... 0.080 inches p-p Frequency change with tilt ... less than 0.1 Hz for vertical unit @ 20' (8 Hz) Transduction (G) ... G = 0.0487 \ Rc where G = volts/inch/sec. Coil inductance (Lc) ... Lc = 3.87-10^-8 Rc where Lc is in henries Basic unit ... Diameter - 1.25 inches Weight - 5.3 ounces



TYPICAL GEOPHONE TRANSDUCER ELEMENT

TYPICAL ARRANGEMENT OF 3-D GEOPHONE

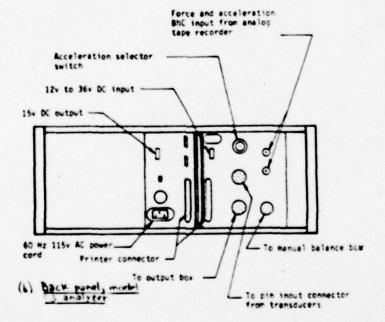




LEGEND:

- A. LED display
- 8. Calibration constant selection switches
- C. Reset switch
- D. Transducer function warning lights
- E. Capacity prediction mode switch
- F. Output selector switches

- 6. LED display selector switch
- H. Operate standby switch
- 1. On off switch
- J. Printer
- L. Paper tape
- L. Menuel print
- M. Paper advance



PILE DRIVING EFFECTS TEST PROGRAM

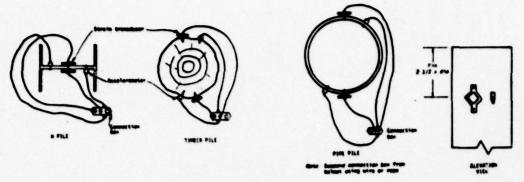
MODEL EB ANALYZER

FOUNDATION INVESTIGATION AND TREST PROGRAM

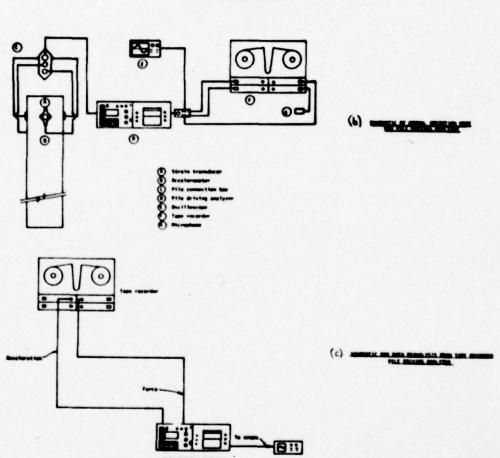
ENIOTING LOCALD AND DAW No. 99
97 LOUIS DISTRICT. CORPS OF ENGINEERS.

PAGEST-170-0000

***** Passe E



(0) WHE SHEET SHEET STREET



PILE DRIVING EFFECTS TEST PROGRAM

SCHEMATICS OF PILE

DRIVING ANALYZER SYSTEM

POURDATION INVESTIGATION AND TEST PROGRAM
ENIGTING LOCKE AND DAM IN, 20

OT LOWIS DISTRICT, CORPS OF SHOMESING.

DAGRED-70-C-00000

Woodward-Chydo Cornadianto
Fig. I. 4

TYGOSO Pooco E

PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDIX J
TIMBER PILE CALIBRATION DETAILS

TABLE OF CONTENTS

		Page
J.1	Tension and Compression Moduli and Ranks for Gages of	
	Timber Piles Under Monolith M2, Tables J.1 through J.8	J-1

Rank

GAGIS A THERE ELS MILLS NOTHER ME

Sage No.	E
	(10 . k/in')
1-1	2227
1-2	2123
1-3	1.488
1-4	1.641
1-5	1992
1-6	1.746
1-7	2263
7-1	2128
2-2	2009
2-3	1964
2-4	1930
2-5	2131
2-7	1.972
	- C. CO1
3-1	1.769
3-2	1.912
3-3	1.709
3-4	1.390
3-5	1509
3-6	1935
3-7	2201
4-1	1.680
4-2	1.930
4-3	1.84
44	1.517
4-5	1.649
.44	1.830
4-7	7.122

	. M: 1.1
7	et or. k/int)
-	1.939
	2239
	2032
	1.888
	2.115
	1.843
-	2204
-	1.939
	1.964
	1.961
	1.417
_	1.631
-	1.887
-	2021
	200
	2107
_	1.805
-	1.391
-	1.955
	2255
	1.834
_	2,114
-	2.183
-	1.778
	1984
	2303

Notes:

Ec : modulus in compression E : modulus in tension

PILE DRIVING EFFECTS TEST PROGRAM TENSION AND COMPRESSION MODULI AND RANKS FOR GAGES OF TIMBER PILE No 14 MONOLITH M2

> ----221971WG LOCES AND DAW No. 80 -----DACT-10-5-0005

-Copde Committeets Toble . J. 1 ******* **** E, **] III A

Eage No.	E
0	(10°. k/int
1-1	
1-2	2.128
1-3	1.642
1-4	1.151
1-5	2.158
1-6	2.067
1-7	8.377
2-1	1,923
2-2	1.885
2-3	2.073
2-4	1.831
2-5	4.136
2-6	1,960
2-7	0.954
3-1	4811
3-2	3680
3-3	3.299
3-4	3.197
3-5	1.904
3-6	1.810
3-7	3,20
4-1	-
3-4	_
4-3	1.692
4-4	1.896
4-5	1.901
44	1.535
4.7	1.942

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Ce modulus in compression

Et: modulus in tension

PILE DRIVING EFFECTS TEST MORRAM
TENSION AND COMPRESSION
MODULI AND RANKS FOR GAGES OF
TIMBER PILE No 30
MONOLITH' M 2

FOUNDATION INVESTIGATION AND TEST PROCRAW
EXISTING LOCAL AND DAW No. 00
01 LOUIS DISTRICT. CORPS OF ENGINEERS.

Weephard Chyde Commitments

Table . J. 2

F100 130	E
tage No.	(100 k/m)
1-1	1.706
1-2	1.816
1-3	1.914
1-4	1846
1-5	1.156
1-6	1.972
1-7	2065
2-1	1.560
2-2	1.434
2-3	1.400
2-4	2004
2-5	1.677
2-6	1.729
2-7	1.641
3-1	1.633
3-2	1.643
3-3	1.636
3-4	1.592
3-5	1.986
3-6	1.801
3-7	1.884
4-1	1.691
4-2	1.713
4-3	1.653
44	
4-5	1.286
44	1,801
4-7	1.829

	Et (10% . k/in'
ł	(10-2 2114
I	1.624
I	1.279
I	1.825
I	1.699
ļ	1.724
ļ	1.824
ı	488
I	
I	1.508
1	1.479
1	1.485
I	1.974
1	1.509
I	1.739
I	1455
I	
l	1.680
l	1.716
Į	1.713
I	1.995
Į	1.851
ı	1.810
ı	1,920
I	
1	1.713
1	1.712
I	1.693
I	1.241
I	1.346
J	1.014
I	1,793

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E: modulus in compression E modulos y lension

PILE DRIVING EFFECTS TEST PROFRAM TENSION AND COMPRESSION MODULI AND RANKS FOR GAGES OF TIMBER PILE No 9 MONOLITH M2

---------47 LOUIS DISTRICT. CORPS OF ENGINEERS.

DACE-10-6-0001 Western Carte Commission Toble . 3. 3 Treeses Mass E's Vol III A

Sage No.	E
0	(10% k/in)
1-1	2.383
1-2	2.283
1-3	1.852
1-4	2.142
1-5	2.564
1-6	2157
1-7_	1.737
2-1	1,890
2-2	1.732
2-3	1.430
7-4	1.813
2-5	1.244
2-6	2094
2-7	1.854
3-1	1.881
3-2	2356
3-3	ZON
3-4	1.699
3-5	1.680
3-6	2068
3-7	1.848
4-1	1.745
J-2	2.268
4-3	1.615
44	1.675
4-5	1.993
- 44	1.874
4-7	

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Le modulus in compression

E modulus in territori

PILE BRIVING EFFECTS TEST PROGRAM TENSION AND COMPRESSION MODULI AND RANKS FOR GAGES OF TIMBER PILE No 17 MONOLITH M2

> -----EXISTING LOCKS AND DAW No. 20 -----DACT-10-C-0005

Woodward-Clyde Consultants ****** # V.I III A

Table. J. 4

c .	1 -
rige No.	(10'. k/in)
-	(10° k/m²)
:1-1	1.392
1-2	1.935
1-3	1.924
1-4	2.102
1-5	2049
1-6	1.907
1-7	2001
2-1	2.056
2-2	1.965
2-3	2182
7-4	
2-5	2227
The state of the s	2.375
2.6	2221
2-7	2.232
3-1	1.705
3-2	1.884
3-3	1956
3-4	2128
3-5	2.227
3-6	1.610
3-7	2088
4-1	1614
4-2	1959
4-3	1781
4-4	2.300
4-5	2290
46	2017
4-7	1,656

	Ex-
(103 k/.m1)
L	1.447
L	1.823
L	1.822
L	1.773
L	1.746
L	1,600
L	1.903
L	
L	1959
L	2.006
L	2.186
L	2.216
L	2.108
L	2.166
L	2.055
L	
L	1.740
L	1.914
L	2.001
L	2.050
L	2051
L	1.611
1	2034
1	
1	1,713
1	2.159
1	2.254
1	2.34
1	7 227
1	7.037
L	1.676

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Ex modulus in compression Ex modulus in tension PILE DRIVING EFFECTS TEST PROGRAM
TENSION AND COMPRESSION
MODULI AND RANKS FOR GAGES OF
TIMBER PILE No 46
MONOLITH M 2

FOUNDATION INVESTIGATION AND TEST PROCRAM
EDICTING LOCAD AND DAW No. 20
OT LOWIS DISTRICT. CORPS OF ENGINEERS.
- DACHES-TO-C-0005

Woodward Chyde Committeetts

Table. J. 5

	Et	
(10% 4/14	
	1.795	
	1.881	
	1.881	
	1.805	
	1.695	
	1.786	
	1.747	
L		
L	1.520	
L	1.562	
	1.519	
L	1.509	
L	1.450	
L	1.549	
L	1.524	
	1.648	
L	4.007	
L	2.537	
-	2.364	
ŀ	1.611	
-	1.483	
ŀ	1.533	
ŀ		
-	1.716	
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-	1.615	
ŀ	1.731	
-	1.635	
ŀ	1.710	

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& modulus in compress Le modulus a lension

PILE BRIVING EFFECTS TEST PROGRAM TENSION AND COMPRESSION MODULI AND RANKS FOR GAGES OF TIMBER PILE No 8 MONOLITH ME

> ---------01 LOUIS DISTRICT. CORPS OF ENGINEERS. DACT-1-10-C-0000

Toble. J. 6 ****** E , Vol III A

Sage No.	E
0	(10° ×/10°)
1-1	1.810
1-2	1.857
1-3	1.993
1-4	2.249
1-5	2.258
1-6	1.641
1-7	2.259
2-1	1.644
2-2	1.748
2-3	1.542
7-4	1.353
2-5	1.592
2-6	1.487
2-7	2042
3-1	1671
3-2	1.524
3-3	1.878
3-4	1.497
3-5	1.352
3-6	1.645
3-7	1.617
4-1	2.016
4-2	1.206
4-3	2090
44	2.110
4-5	1.866
.44	1.776
4.7	7,070

,	Et 101. k/m2)
	-
	1.513
	1.615
	1.745
	1.628
	1.469
	1.300
	2,156
	1.676
	1,307
	1.718
	1.427
	1,501
	1.685
_	2.085
	1.822
	2038
	1.911
	1.529
	1141
	1.572
-	1.511
	1.792
	1.057
	1.787
	1.734
	1.46
	1.632
	1.818

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te modulus in compression

PILE DRIVING EFFECTS TEST PROFRAM
TENSION AND COMPRESSION
MODULI AND RANKS FOR GAGES OF
TIMBER PILE No. 10
MONOLITH M 1

POUND A TION BY EST TOATION AND TEST PROCEDU ENGTING LOCKE AND DAW No. 20 OT LOUIS DISTRICT. CORPS OF ERGINEERS.

Weekenst Clyde Committeets

Table . 3. 7

Sage No.	E. (10°. k/·•*)
	(10° . k/+==)
1-1	1.665
1-2	1.880
1-3	1.775
1-4	1.294
1-5	2144
1-6	2147
1-7	1.532
2-1	1053
2-2	1.853
	1.738
2-3	1.633
2-5	
	1.858
2-7	1.786
-61	1.100
3-1	1.837
3-2	1712
5-3	1966
3-4	1.793
3-5	2342
3-6	2058
3-7	2013
4-1	1731
4-5	1.643
4-3	1819
44	1976
4-5	2118
44	1.840
4-7	2002

	Ex	
1	10'. k/in	
	1.638	
	2.139	
	2103	
	1.862	
	203	
	2.343	
	1.779	
	1.692	
	1,762	,
-	1.852	
	1.328	
	1.700	
	1.816	
	1.825	
	1.668	
	1,618	
	1.675	
	1.602	
	1.854	
	1709	
	1,656	
	1.977	
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OT LOUIS DISTRICT. CORPS OF ENGINEERS.

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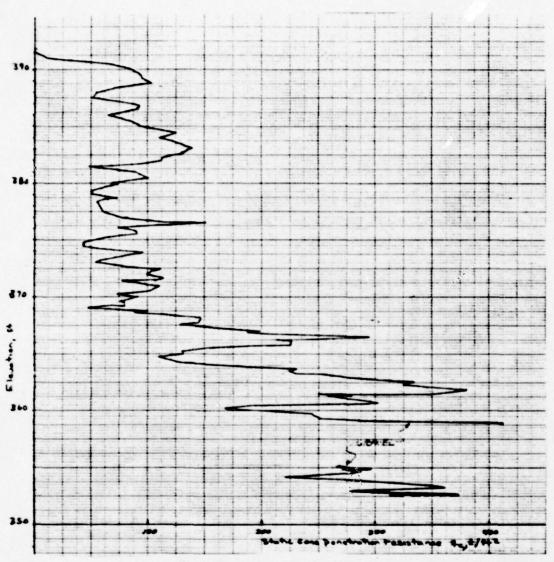
PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

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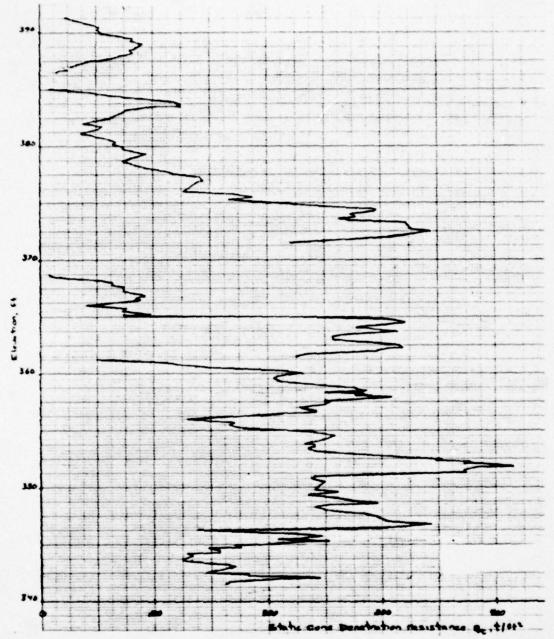


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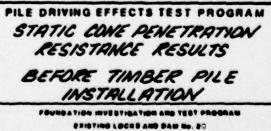
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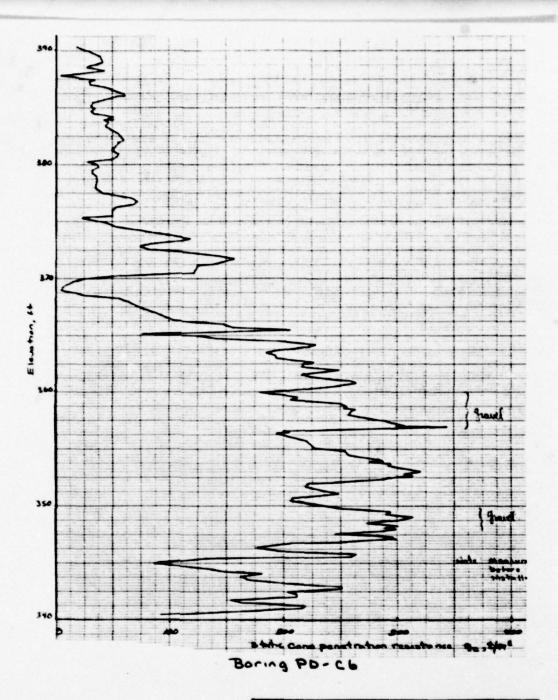


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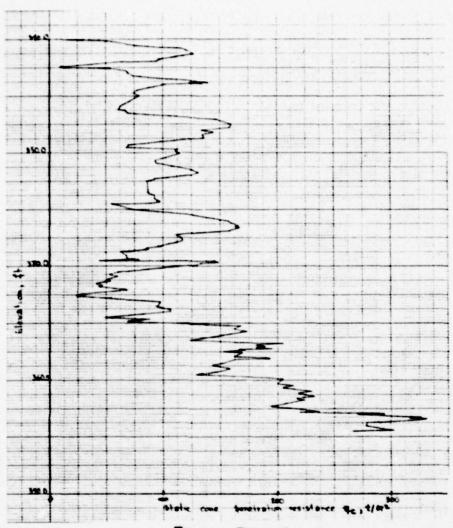
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PILE DRIVING EFFECTS TEST PROGRAM
STATIC CONE PENETRATION
RESISTANCE RESULTS

BEFORE TIMBER PILE INSTALLATION

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EXISTING LOCKE AND DAM No. 26
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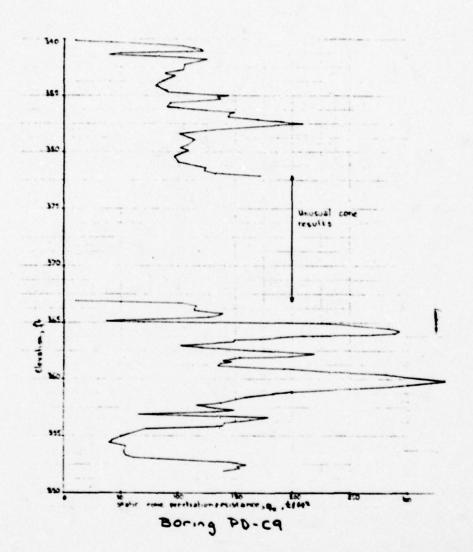
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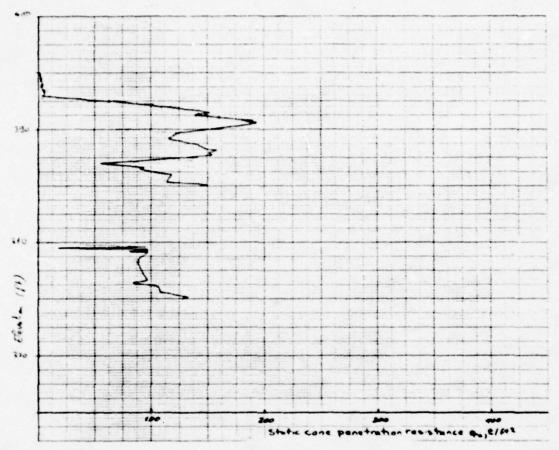


PILE DRIVING EFFECTS TEST PROGRAM
STATIC CONE PENETRATION
RESISTANCE RESULTS

BEFORE TIMBER PILE

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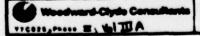


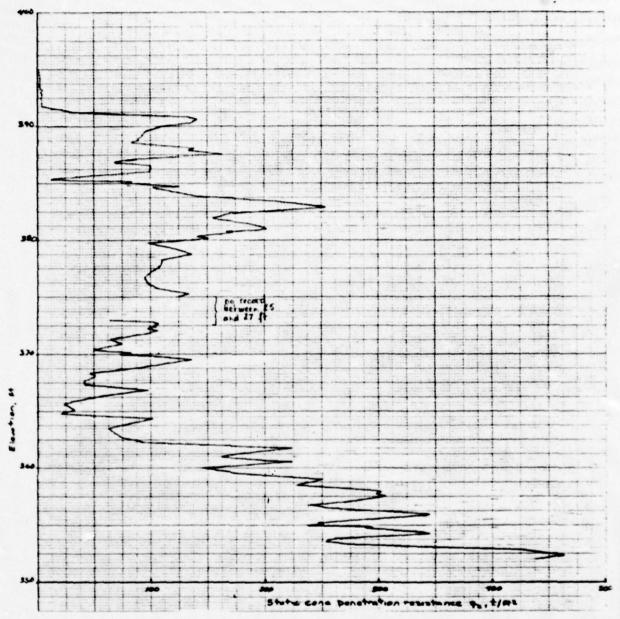
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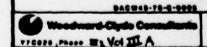
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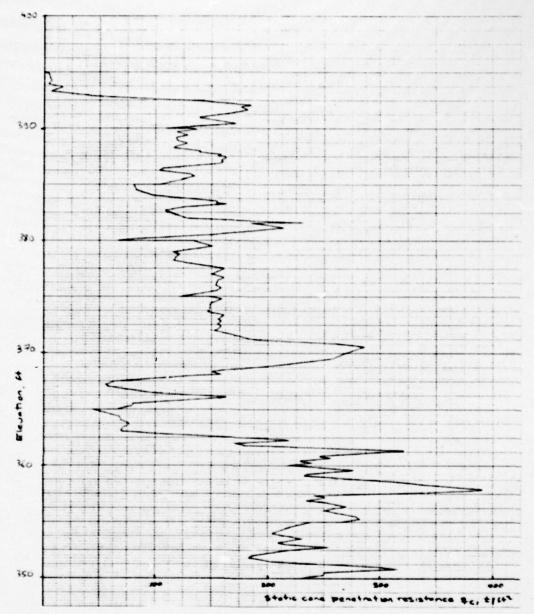


RESISTANCE RESULTS

BEFORE TIMBER PILE

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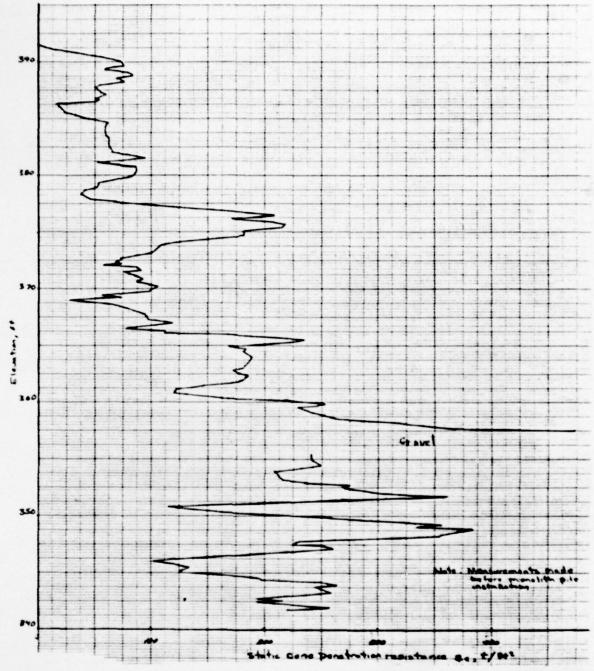
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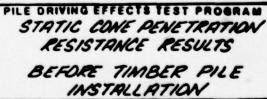
BEFORE TIMBER PILE INSTALLATION

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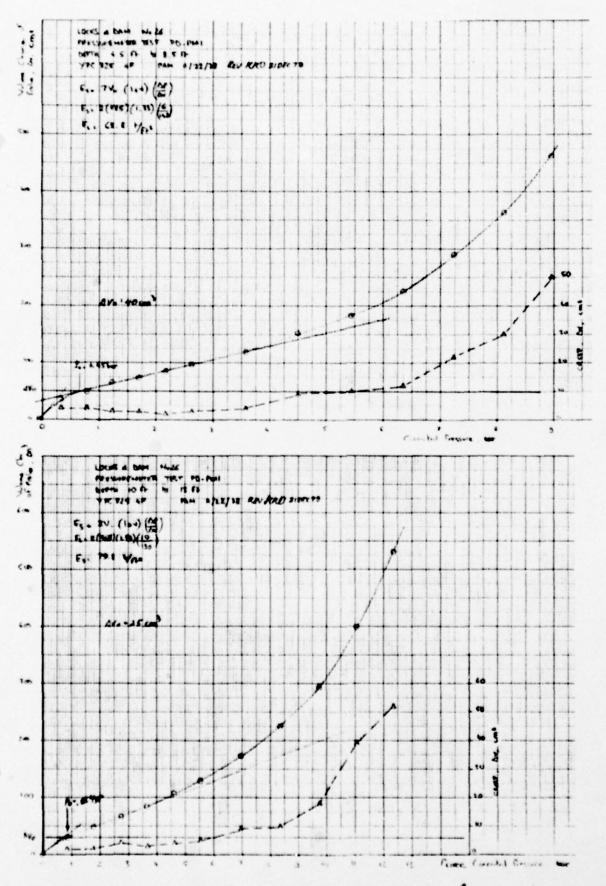
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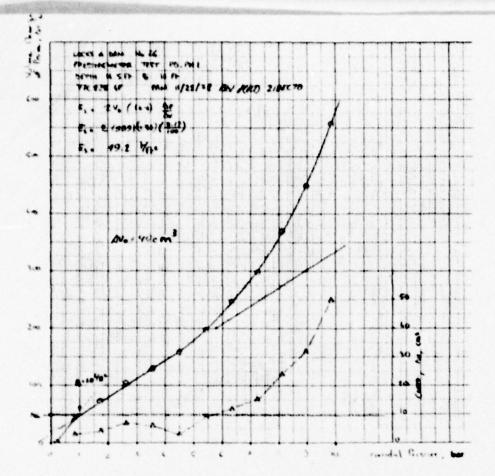




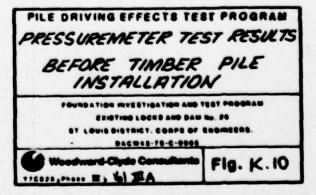
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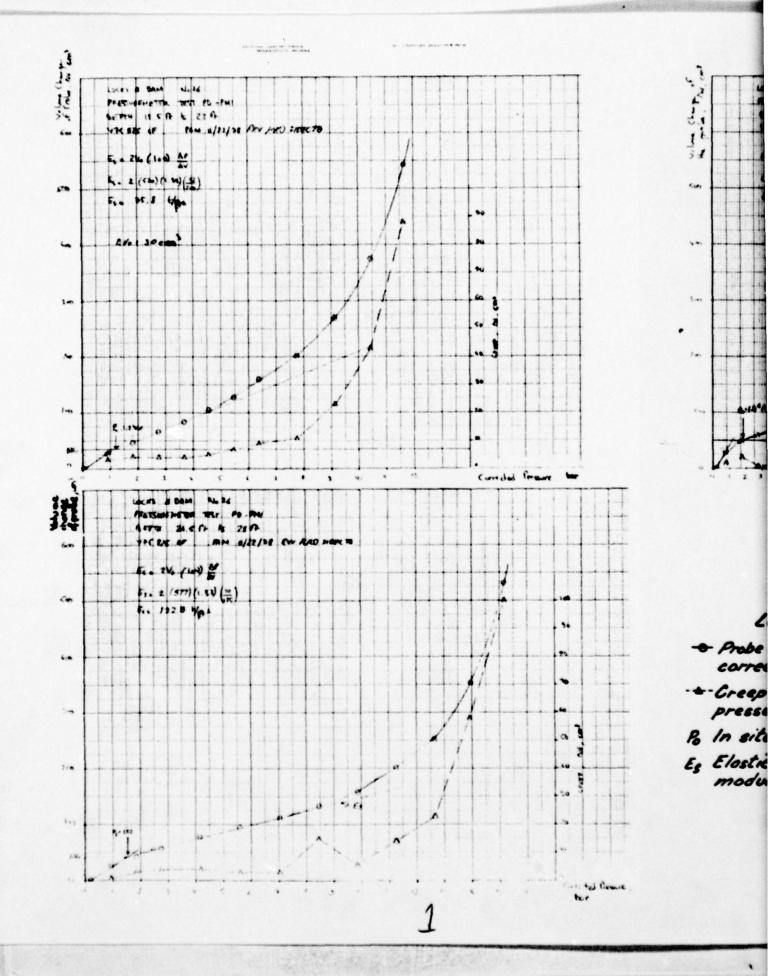
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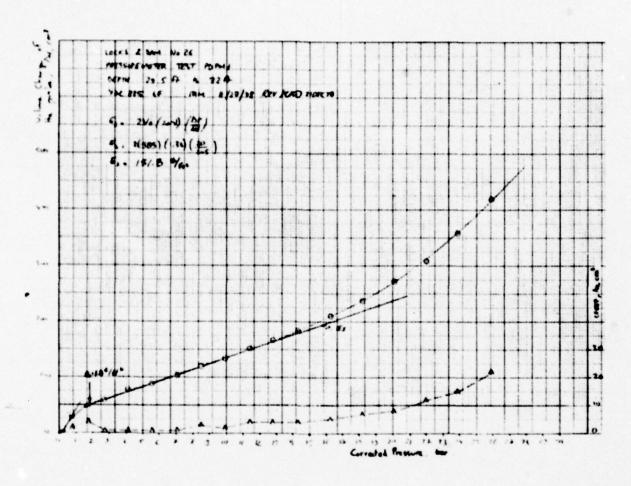
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- Probe volume change versus corrected pressure
- Creep versus corrected pressure
- Po In situ horizontal stress
- Es Elastic deformation modulus







- Probe volume change versus corrected pressure
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- Po In situ horizontal stress
- Es Elostic deformation modulus



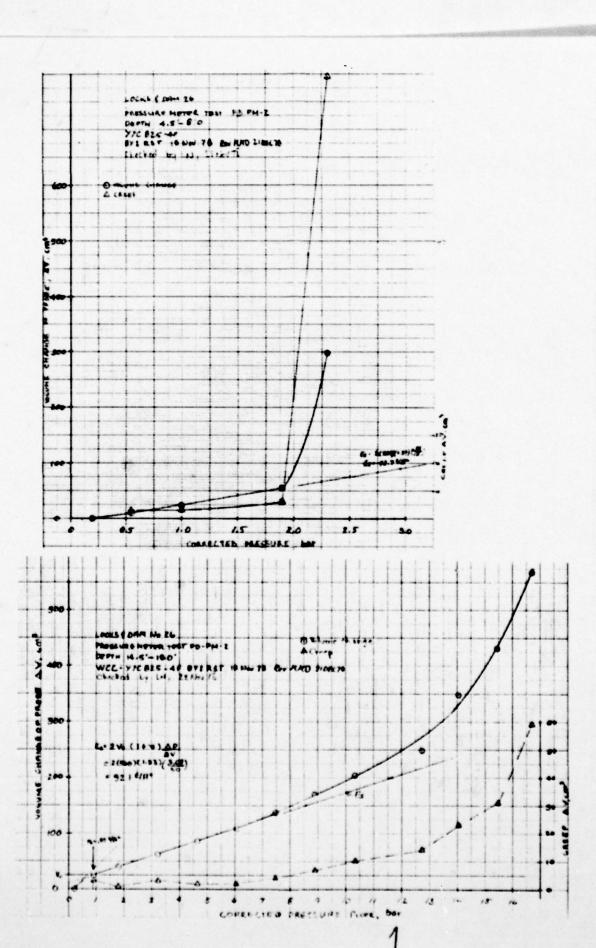
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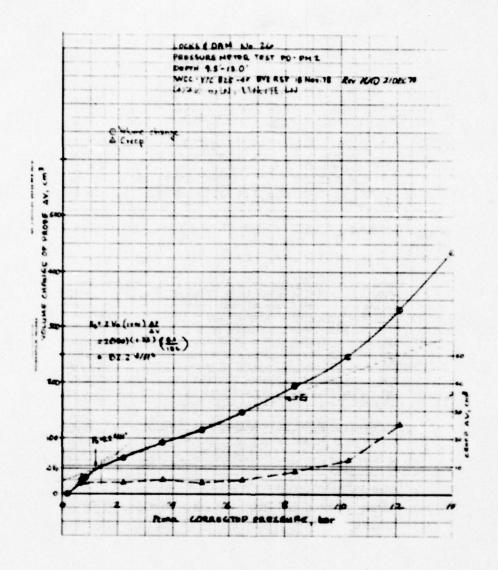
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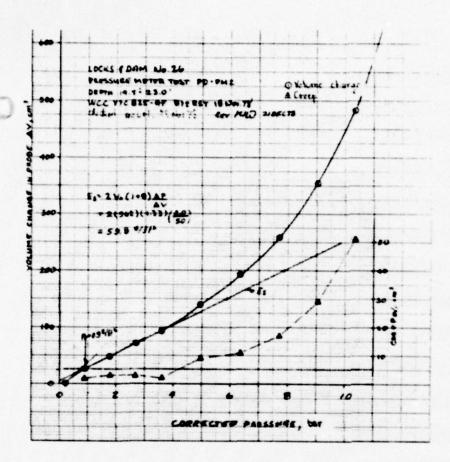
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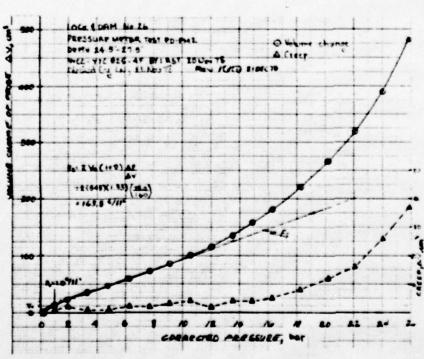
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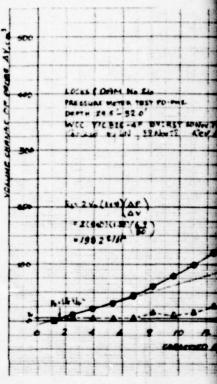
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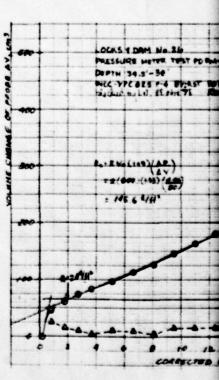
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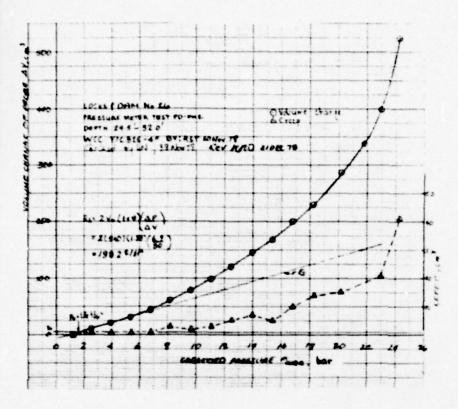
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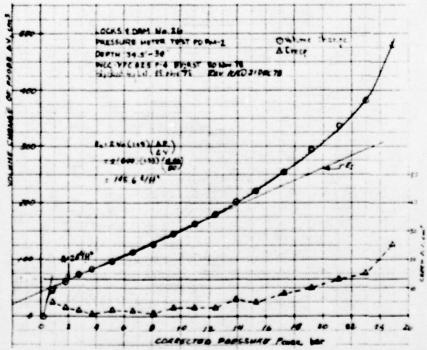












- -- Probe volume change versus corrected pressure
- --- Creep versus corrected pressure
- Po In situ horizontal stress
- Es Elostic deformation modulus

PILE DRIVING EFFECTS TEST PROGRAM
PRESSUREMETER TEST RESULTS

BEFORE TIMBER PILE

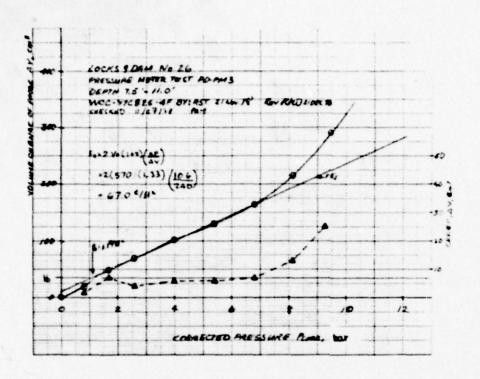
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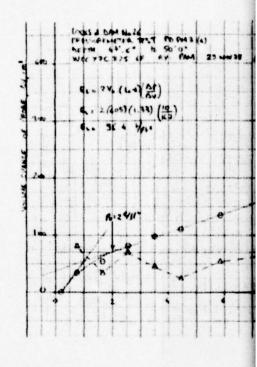
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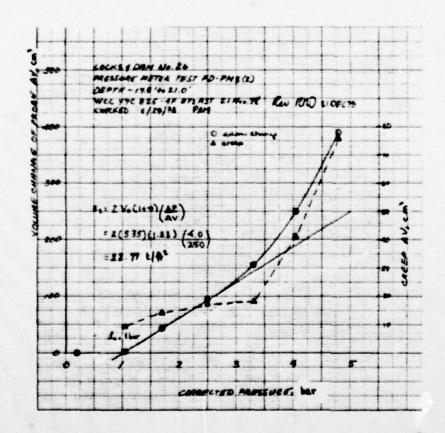
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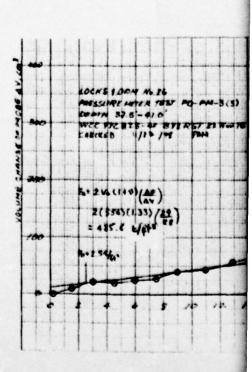
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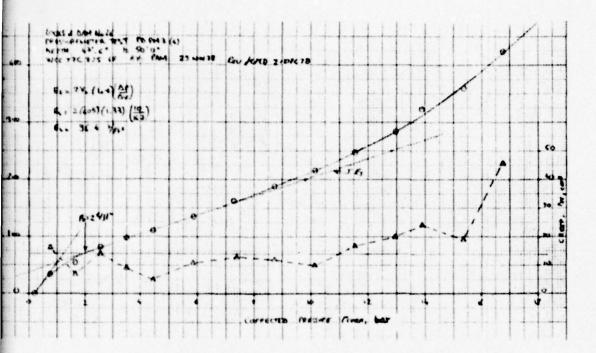
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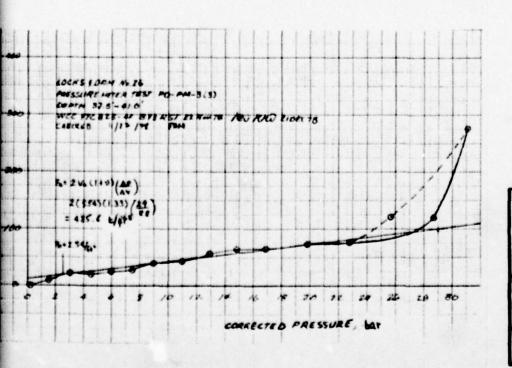












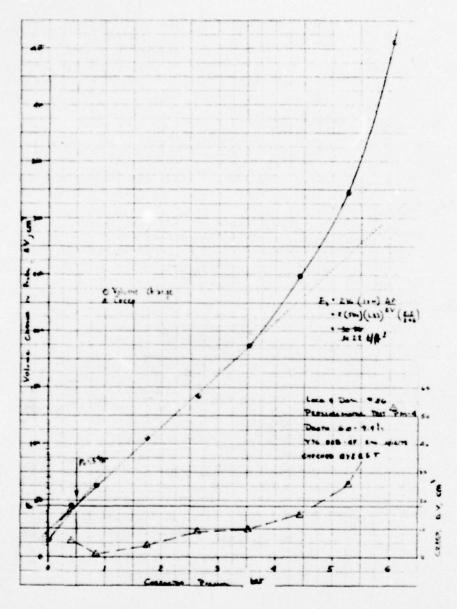
- Probe volume change versus corrected pressure
- -- Creep versus corrected pressure
- Po In situ horizontal stress
- Es Elostic deformation modulus

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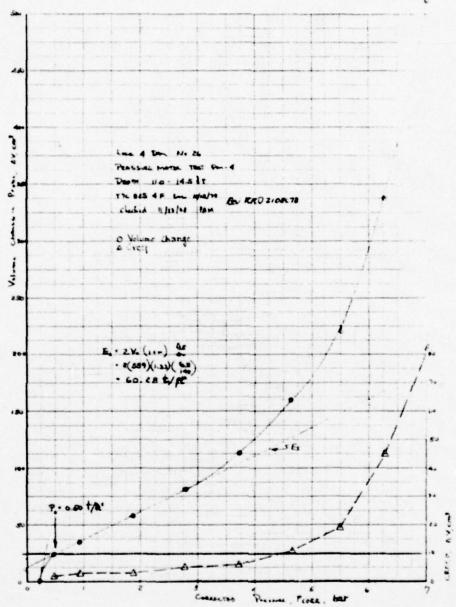
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- Probe volume change versus corrected pressure
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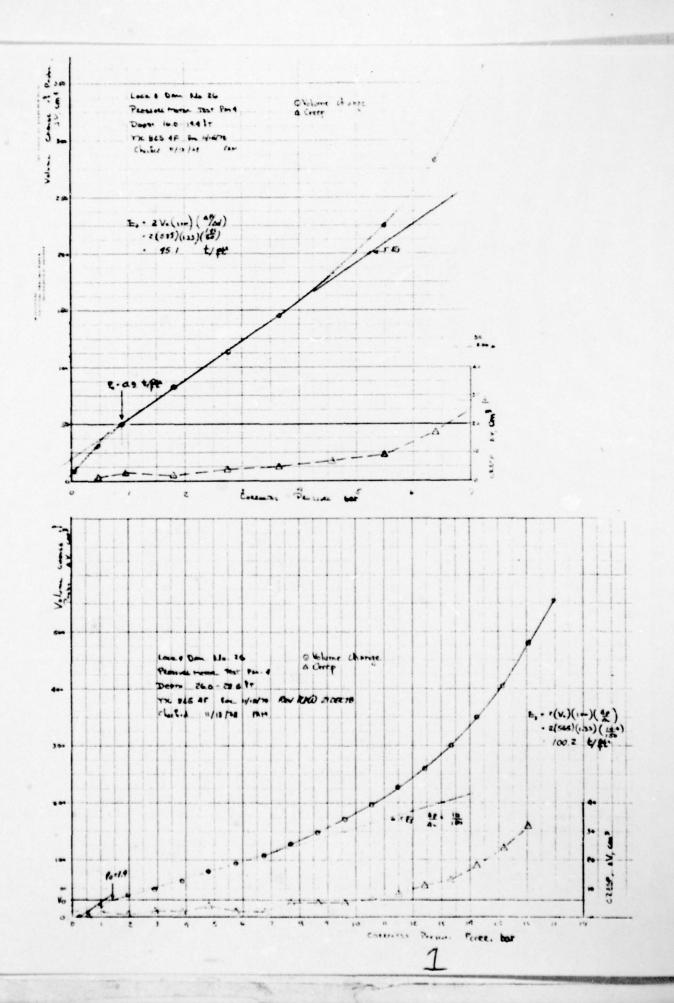
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PRESSUREMETER TEST RESULTS

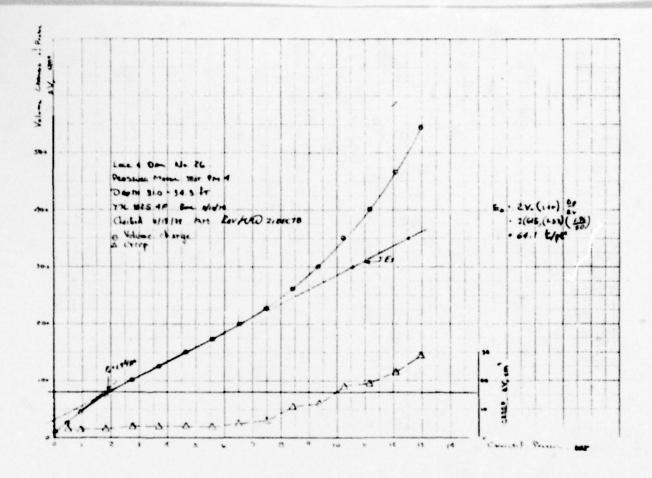
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ST LOUIS DISTRICT. CORPS OF ENGINEERS.
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- Probe volume change versus corrected pressure

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Po In situ horizontal stress

Es Elostic deformation modulus

PILE DRIVING EFFECTS TEST PROGRAM PRESSUREMETER TEST RESULTS

BEFORE TIMBER PILE INSTALLATION

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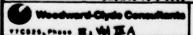
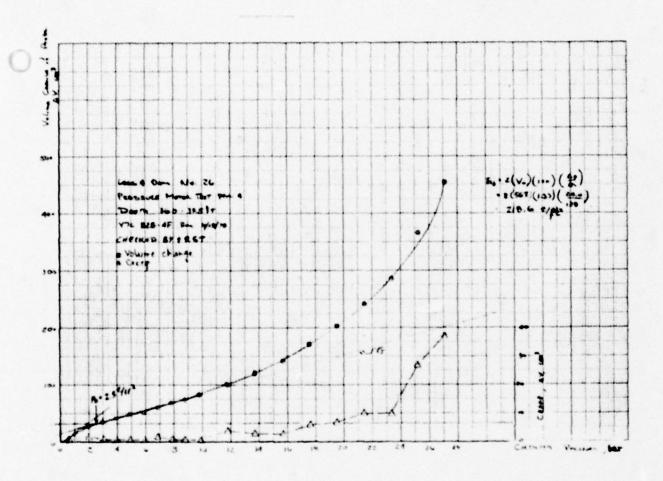
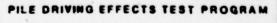


Fig. K.IG



- -- Probe volume change versus corrected pressure
- - Creep versus corrected pressure
- Po In situ horizontal stress
- Es Elastic deformation modulus



PRESSUREMETER TEST RESULTS BEFORE TIMBER PILE INSTALLATION

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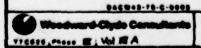
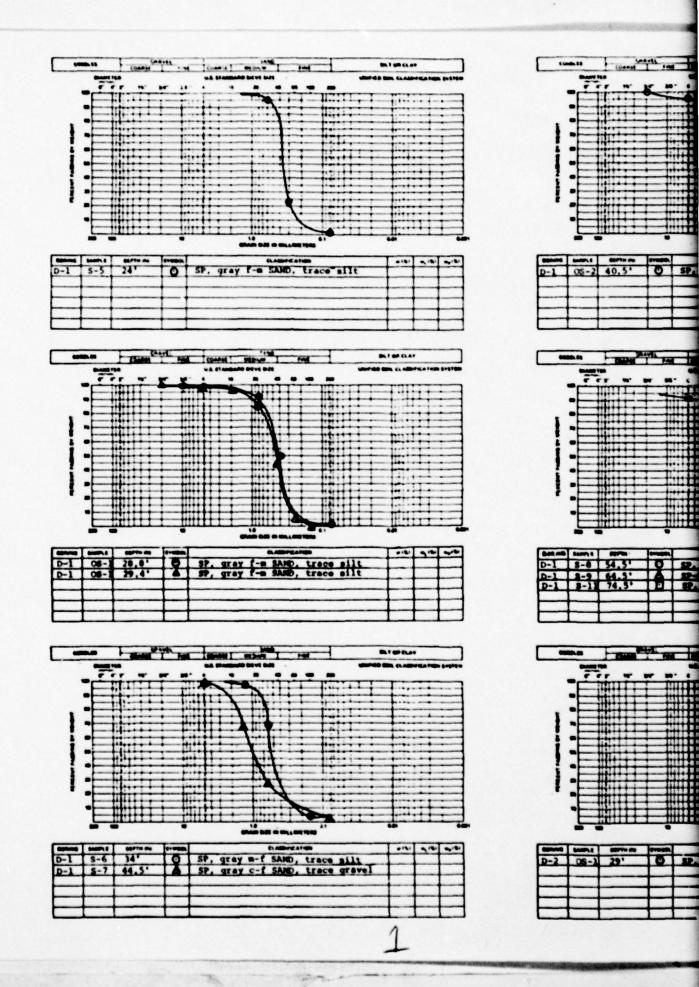
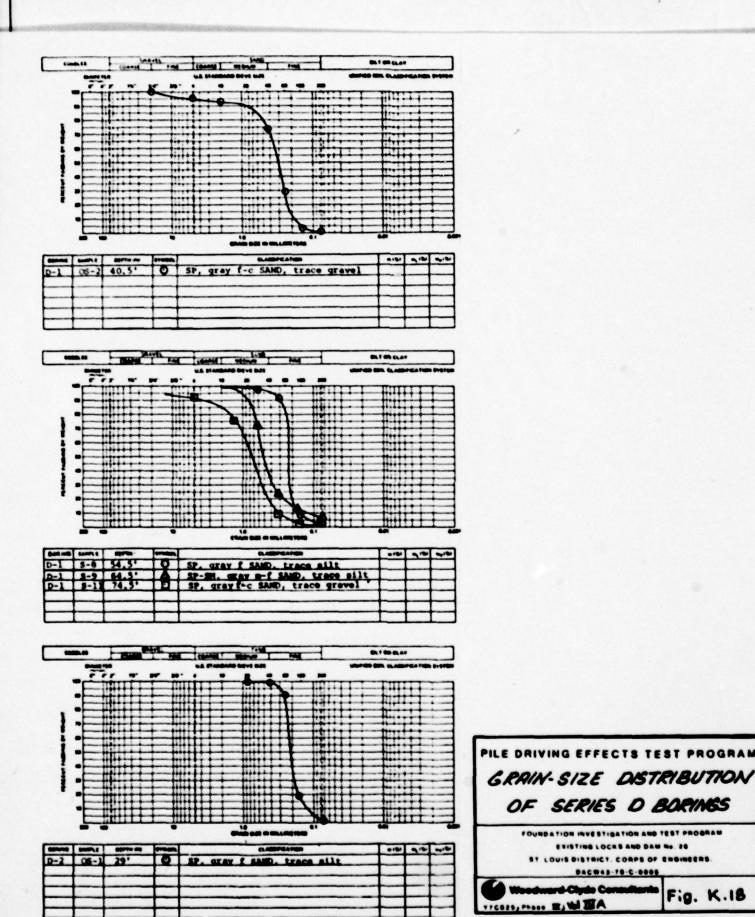


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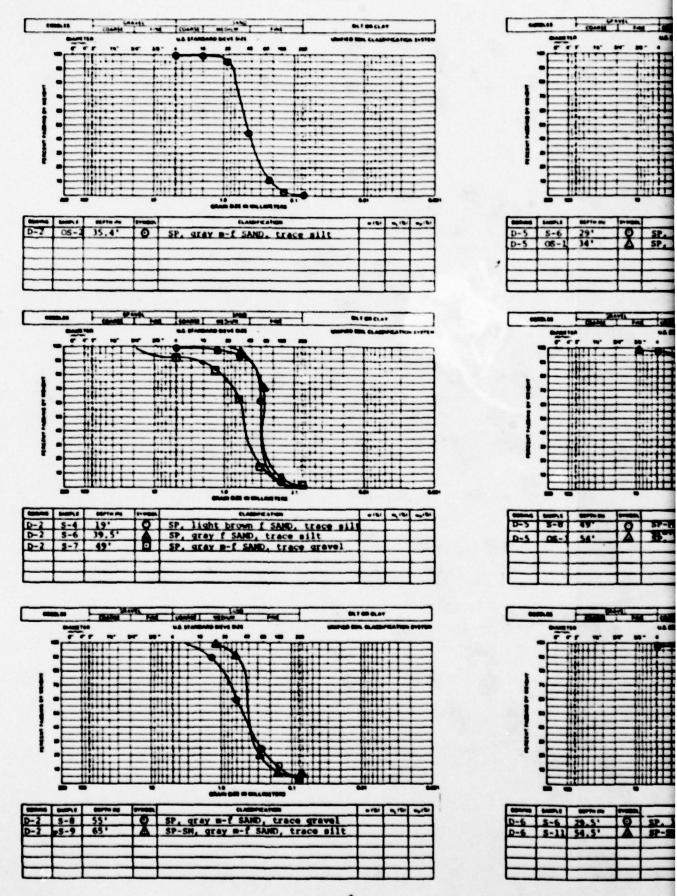




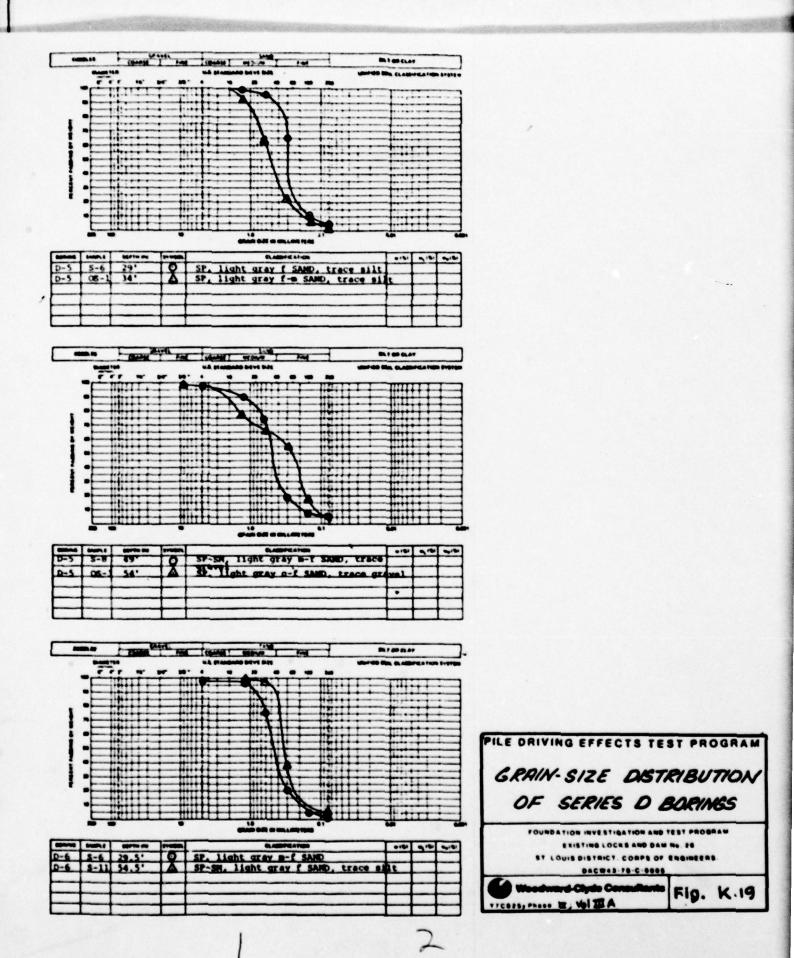
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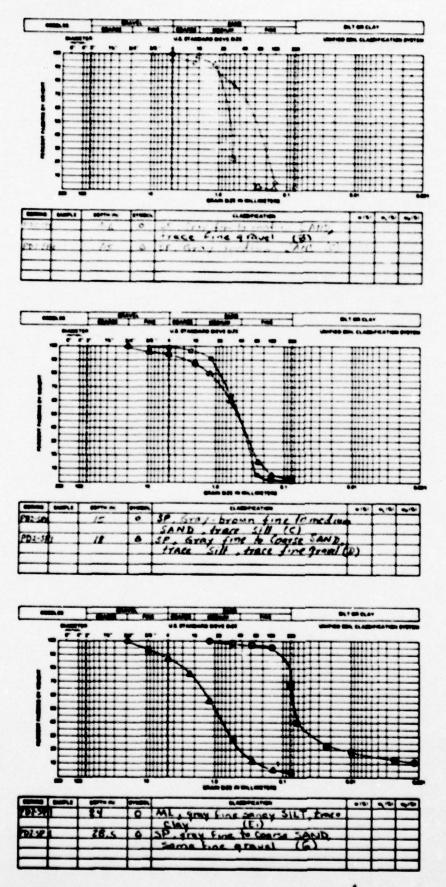
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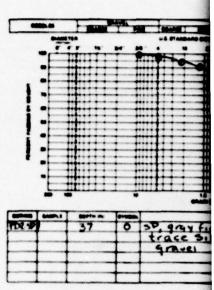


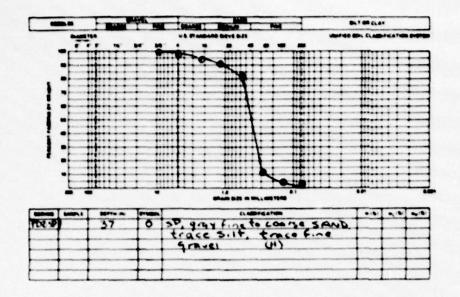
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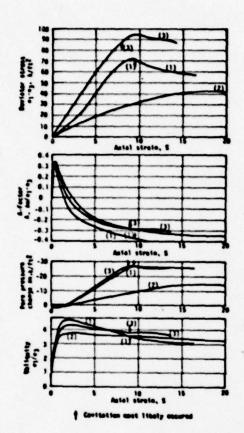


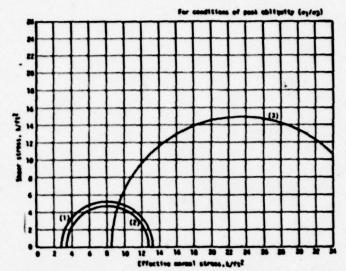


FOUNDATION INVESTIGATION AND TEST PROGRAM
EXISTING LOCKS AND DAM No. 26
ST LOUIS DISTRICT, CORPS OF ENGINEERS.
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Fig. K.20





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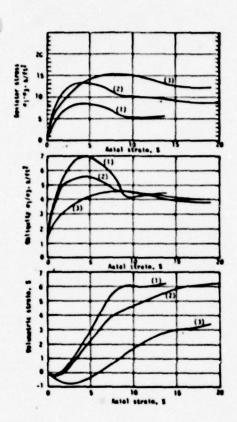
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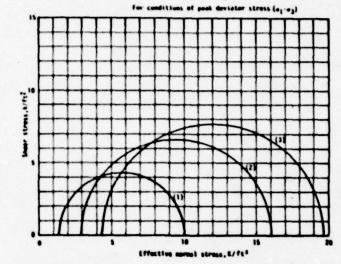
RESULTS OF CID TRIAXIAL **COMPRESSION TESTS** UNDISTURBED SAMPLES

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Fig. K.21





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2. ac- 2.000/ft2;boring 0-2 0 20 ft By- 775 ofter consolidation

3. ac* 4.336/ft2 morting 8-2 0 36.4 ft By- 905 ofter consolidation
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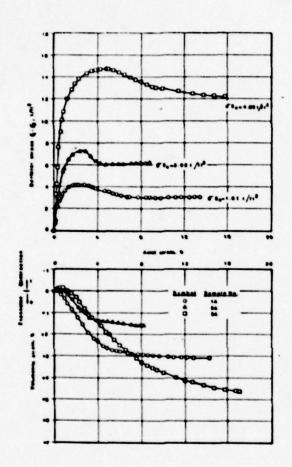
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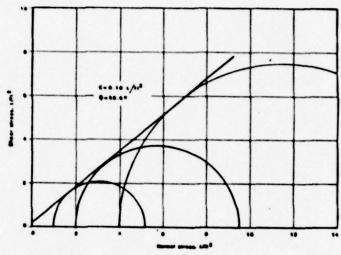
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PILE DRIVING EFFECTS TEST PROGRAM

RESULTS OF CID TRIAXIAL COMPRESSION TESTS RECONSTITUTED SAMPLES

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EXISTING LOCKS AND DAW No. 24
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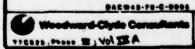
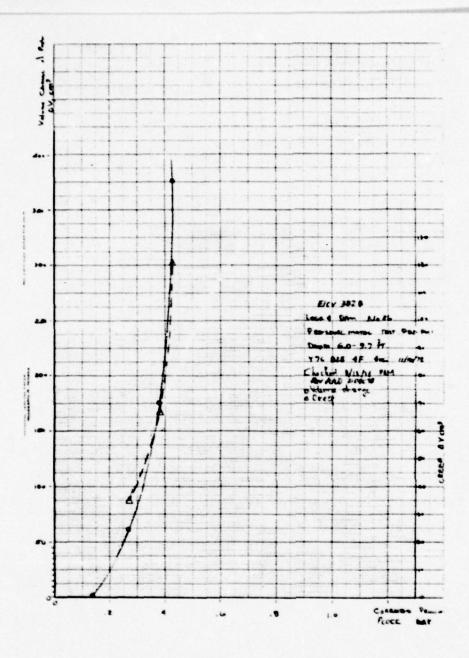
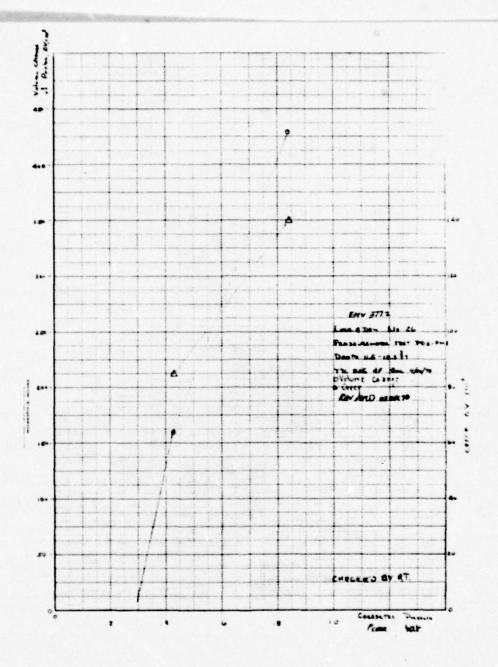


Fig. K.23



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- --- Probe volume change versus corrected pressure
- Creep versus corrected pressure

PILE DRIVING EFFECTS TEST PROGRAM
PRESSUREMETER TEST RESULTS

AFTER TIMBER PILE
INSTALLATION

FOUNDATION INVESTIGATION AND TEST PROGRAM
EXISTING LOCKS AND DAM No. 26
ST LOUIS DISTRICT, CORPS OF ENGINEERS.

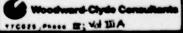
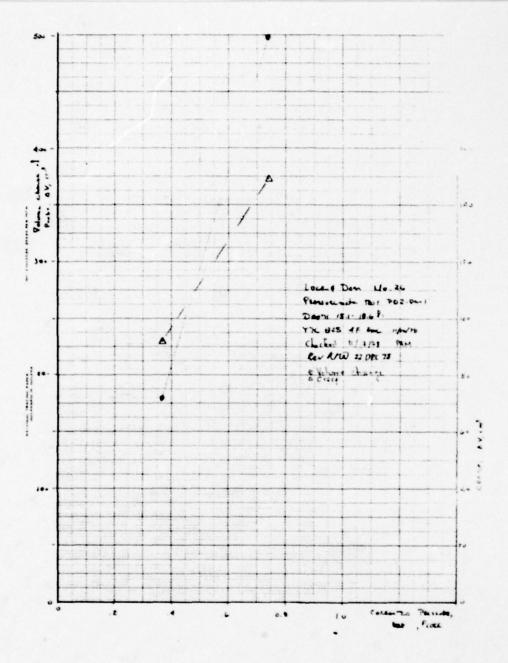
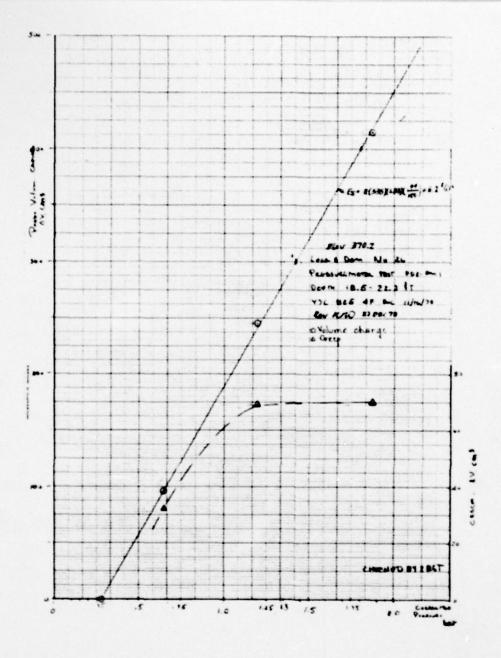


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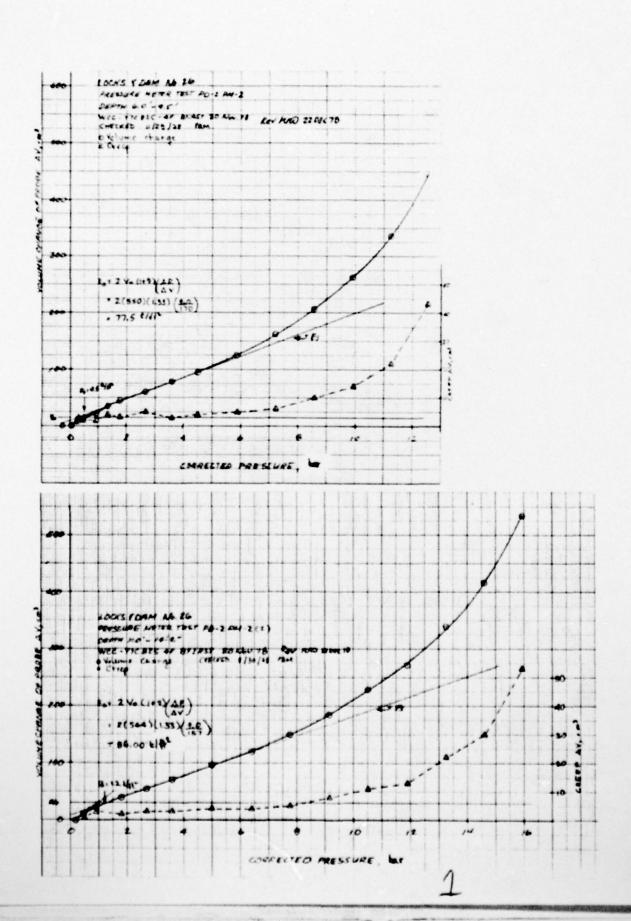
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- + Greep versus corrected pressure
- Po In situ horizontel stress
- Es Elostic deformation modulus



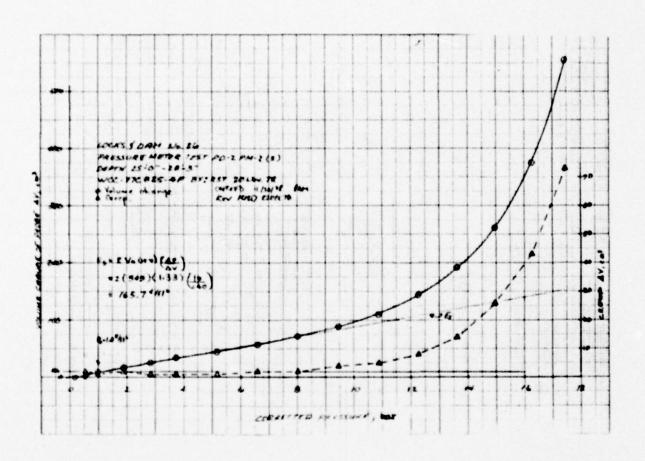
POUNDATION INVESTIGATION AND TEST PROCESSES EXISTING LOCKE AND DAW No. 20 BY LOWIS DISTRICT, CORPS OF EROMISERS. DACES-10-C-0005

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- Probe volume change versus corrected pressure
- -- Creep versus corrected pressure
- Po In situ horizontal stress
- Es Elastic deformation modulus

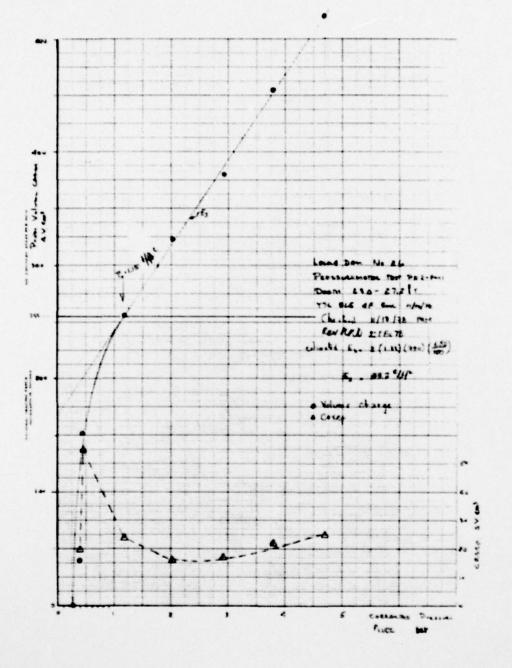
PILE DRIVING EFFECTS TEST PROGRAM PRESSUREMETER TEST RESULTS AFTER TIMBER PILE INSTALLATION

FOUNDATION INVESTIGATION AND TEST PROGRAM
EXISTING LOCKS AND DAM No. 20
ST LOUIS DISTRICT, CORPS OF ENGINEERS.

PACH41-70-C-0001

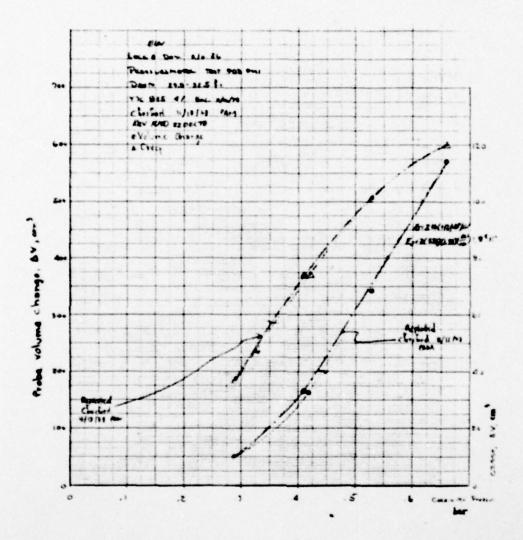
Woodward-Clydo Consultanto

FIg K.26



Robe volume change. BV, and

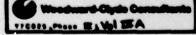
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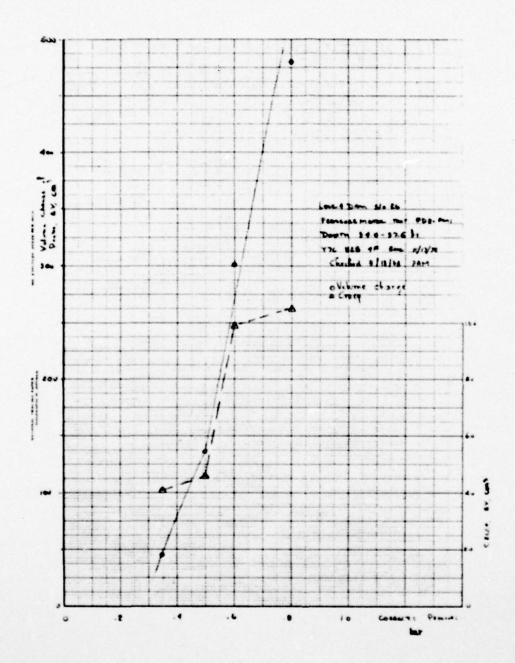
- --- Probe volume change versus corrected pressure
- -+ Greep versus corrected pressure
- Ro In situ horizontel stress
- Es Elestic deformation modulus

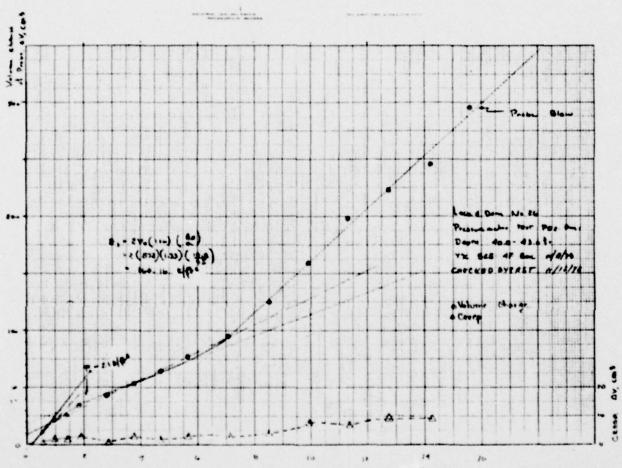
PILE DRIVING EFFECTS TEST PROGRAM PRESSUREMETER TEST RESULTS AFTER TIMBER PILE INSTALLATION

COURS ATION INVESTIGATION AND TEST PROGRAM
EXISTING LOCKS AND DAM No. 20
57 LOUIS DISTRICT. CORPS OF ENGINEERS.



Flg. K.27





Corrected Pressure, bar

- Probe volume change versus corrected pressure
- -- Creep versus corrected pressure
- Po In situ horizontel stress
- Es Elestic deformation modulus



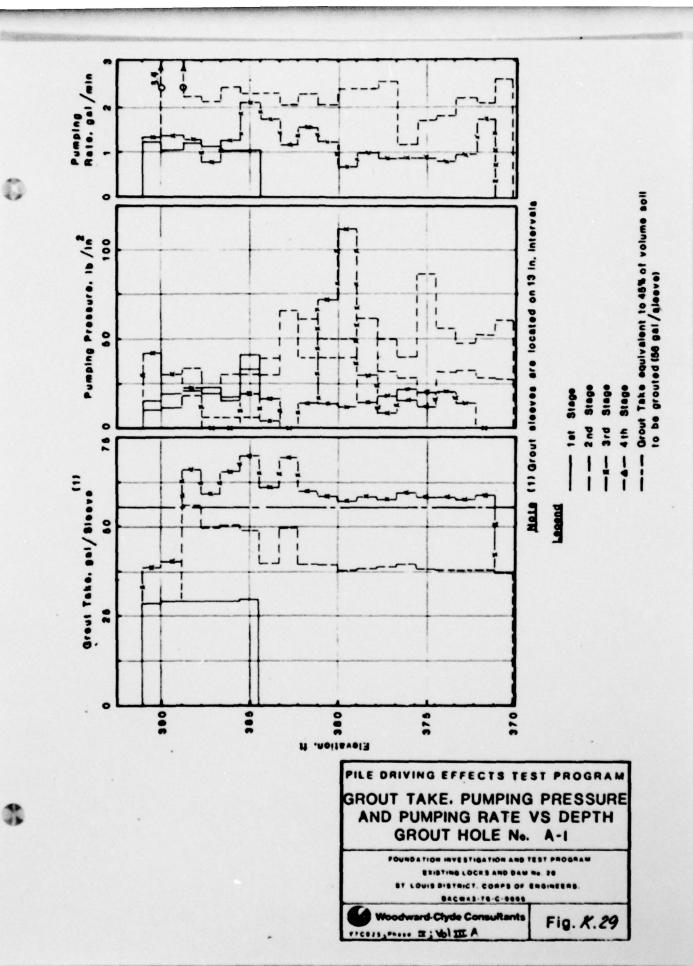
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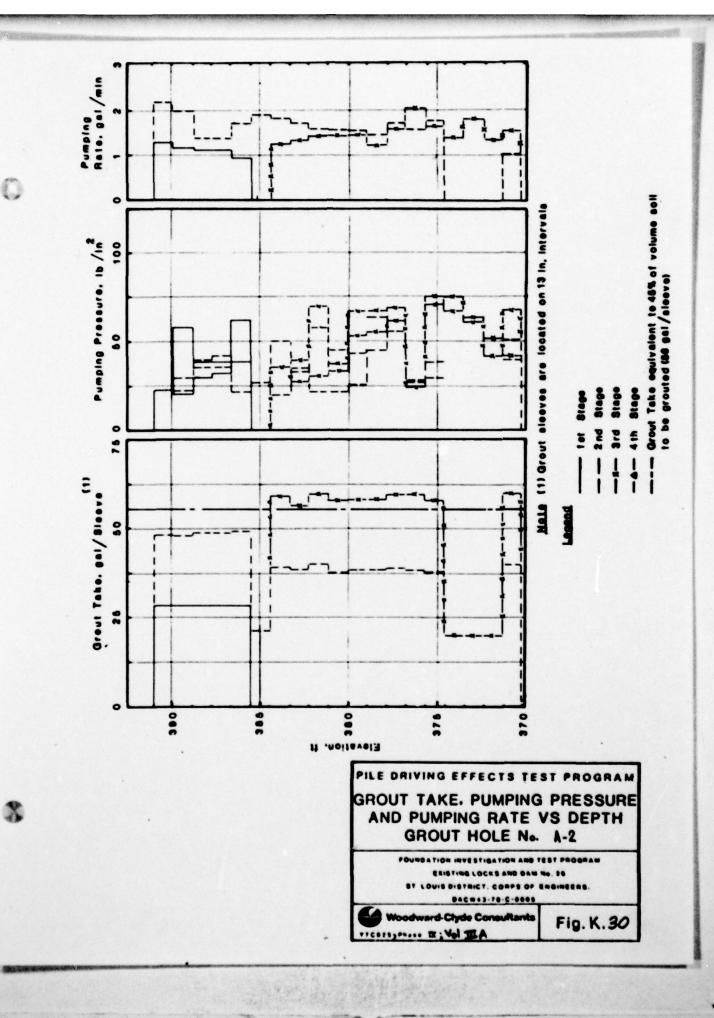
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EXISTING LOCKS AND DAM No. 20
ST LOUIS DISTRICT, CORPS OF ENGINEERS.

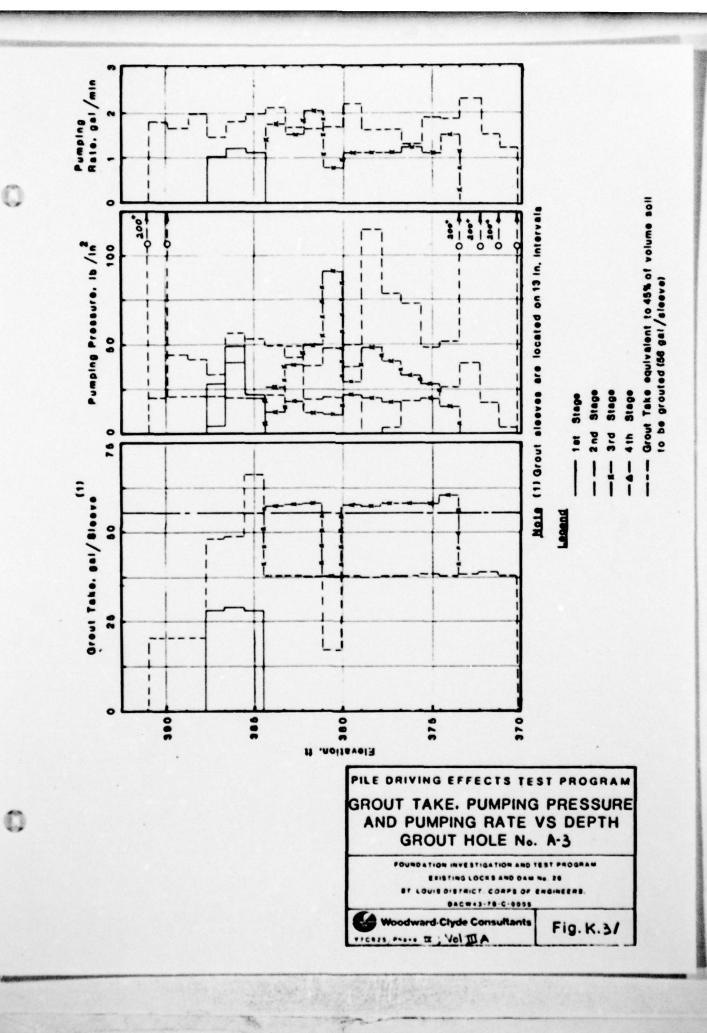
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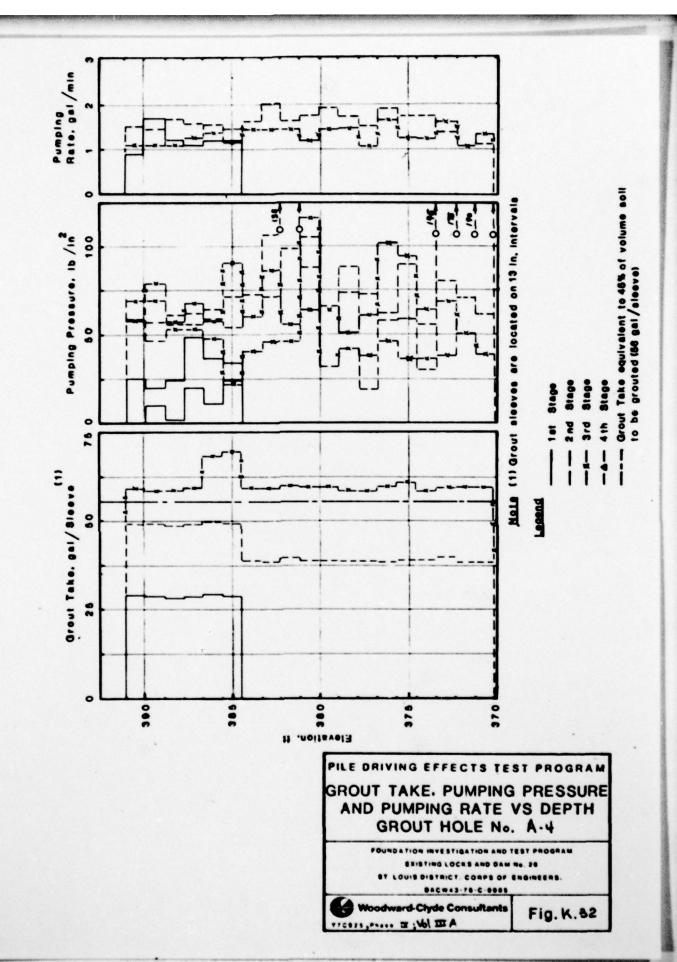
Woodward-Clyde Consultants

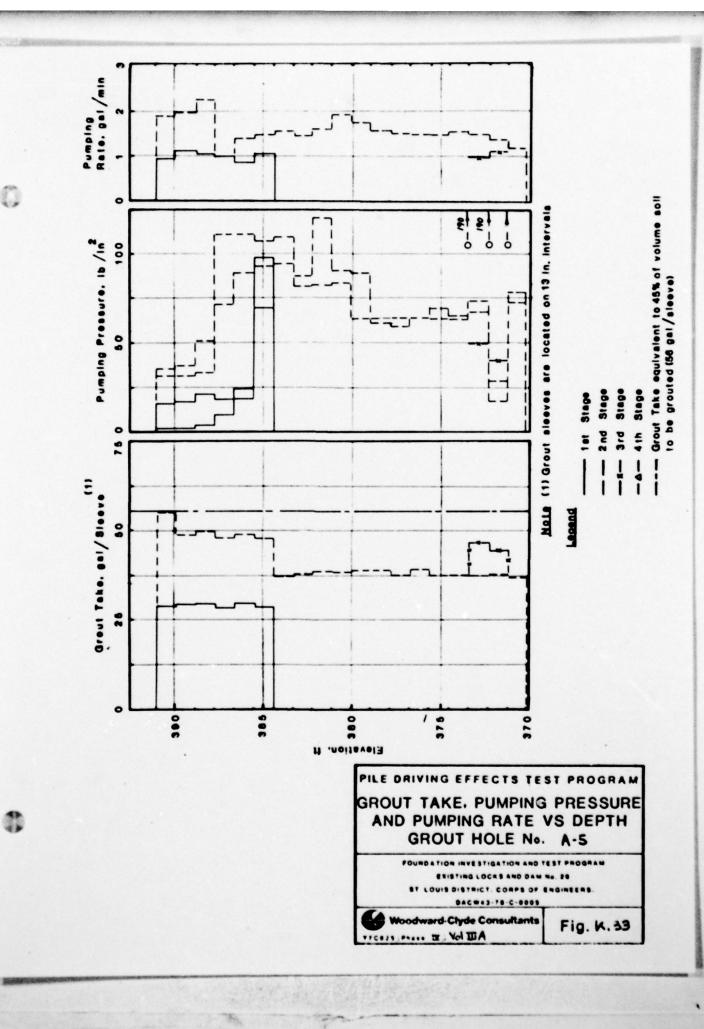
Fig. K.28

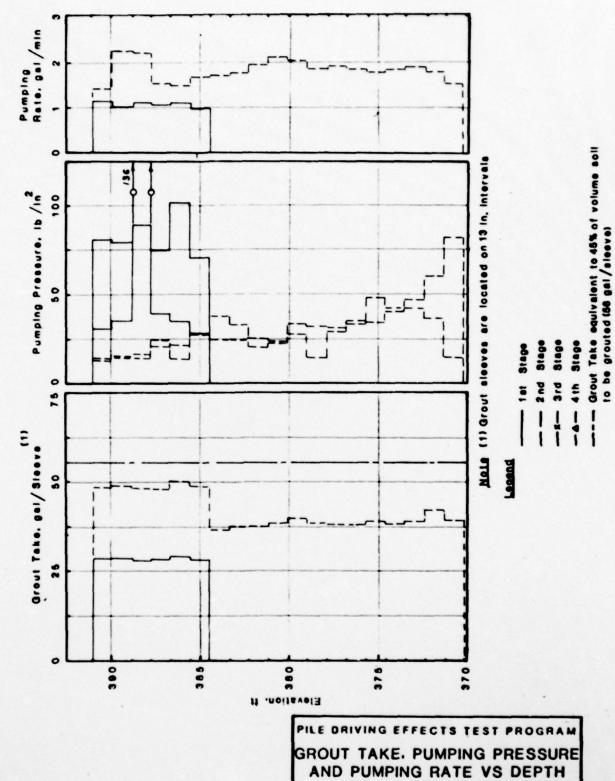












AND PUMPING RATE VS DEPTH GROUT HOLE No.

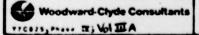
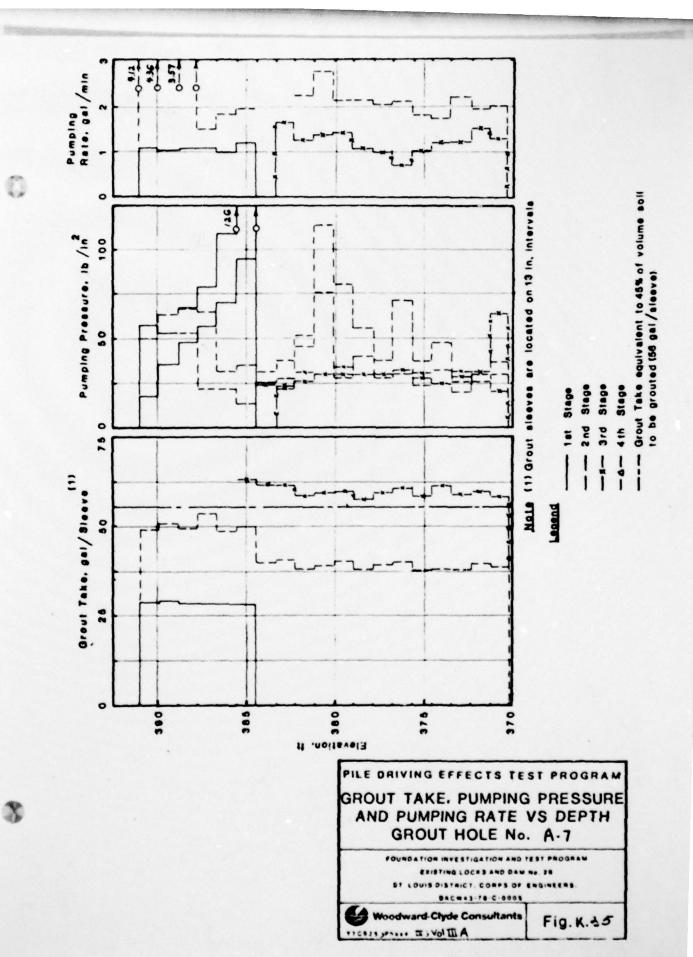
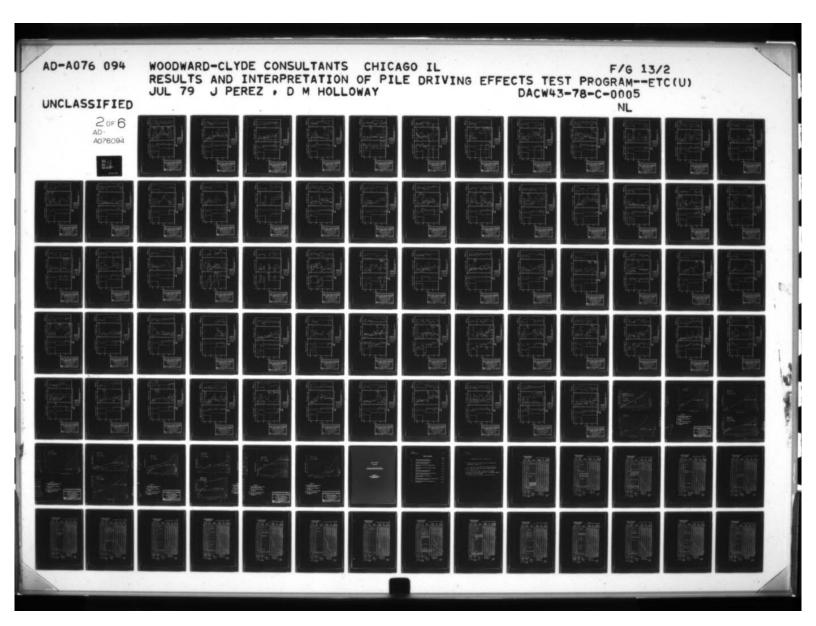
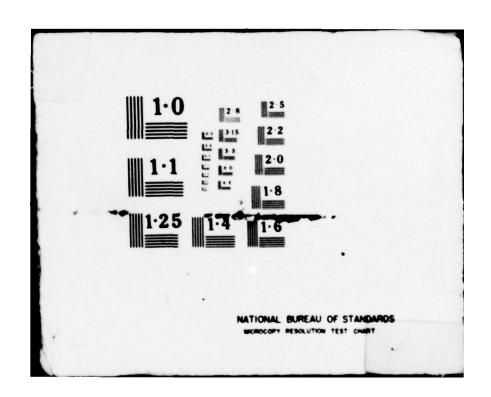
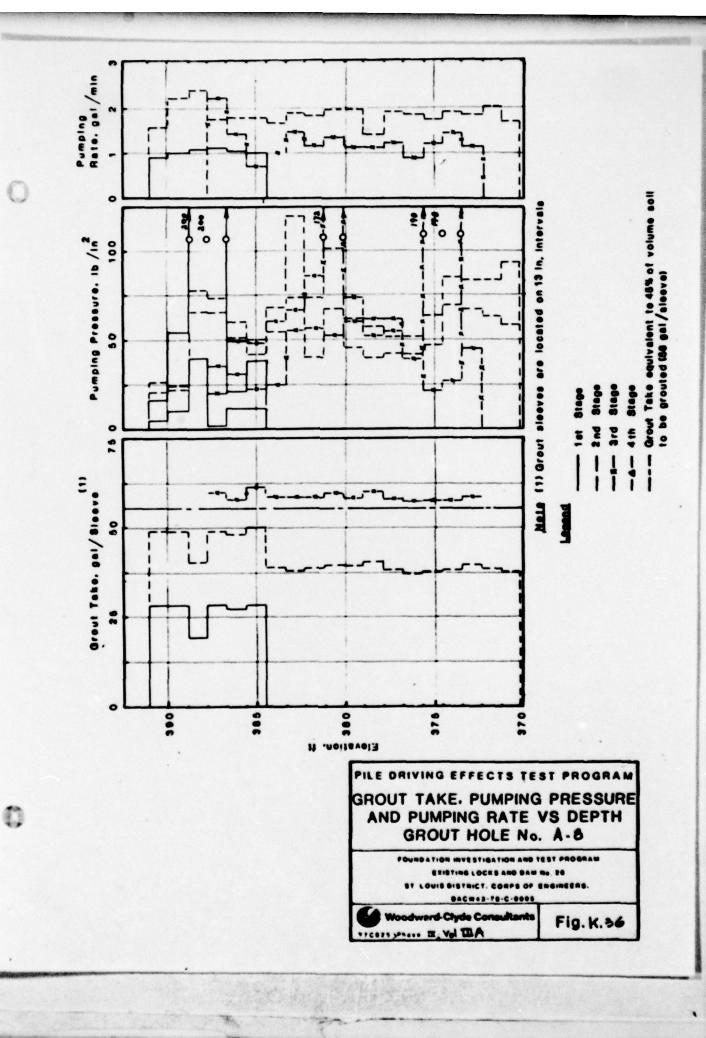


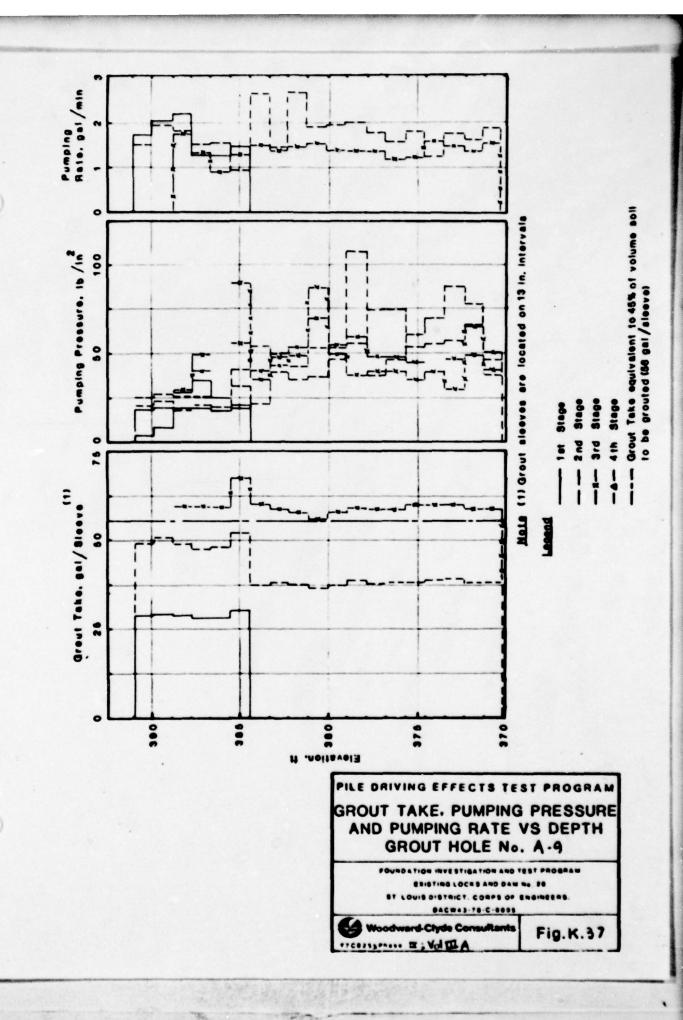
Fig. K. 34

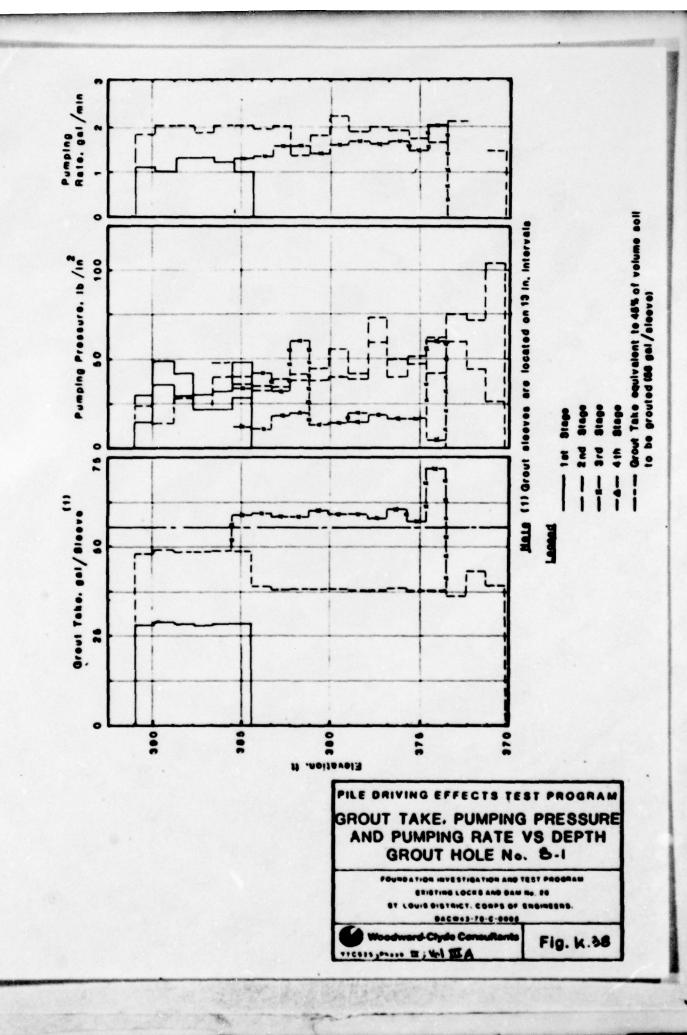


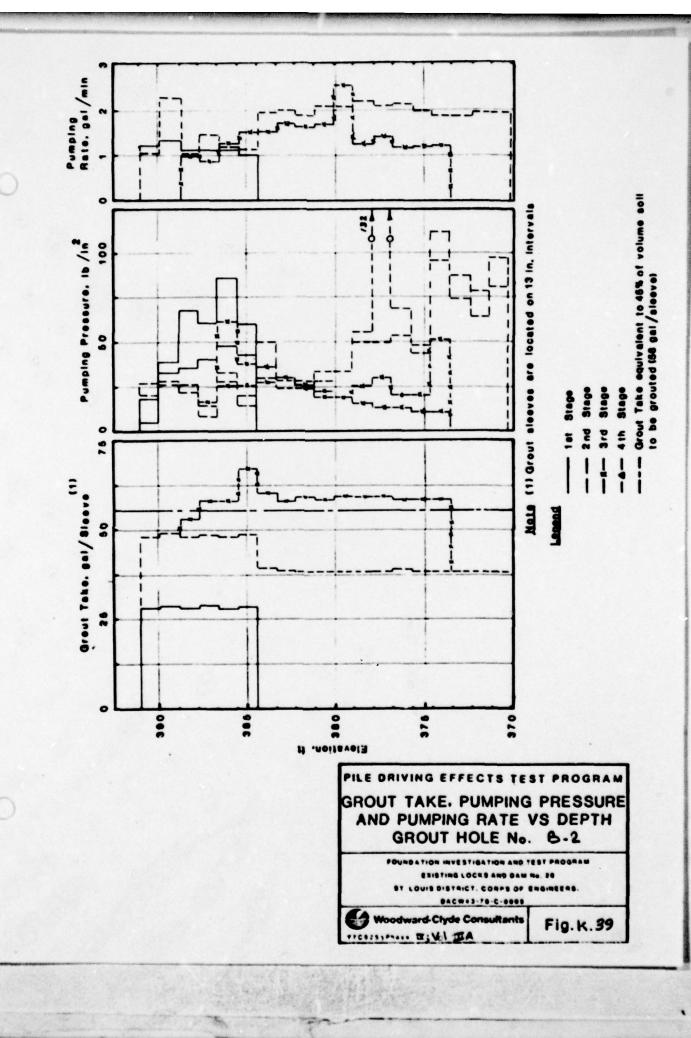


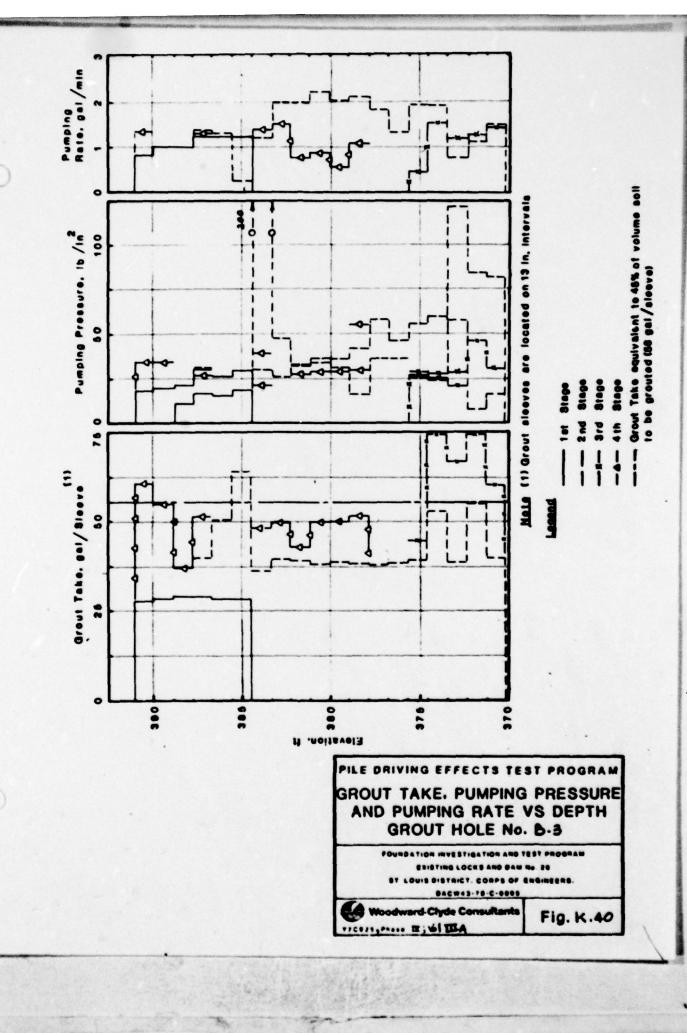


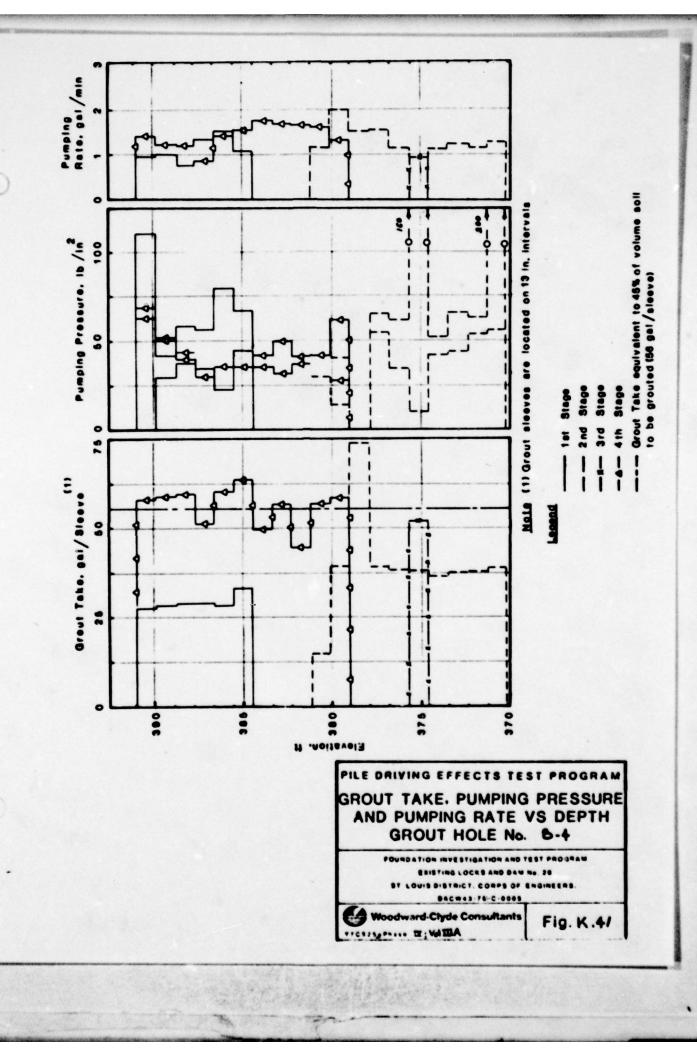


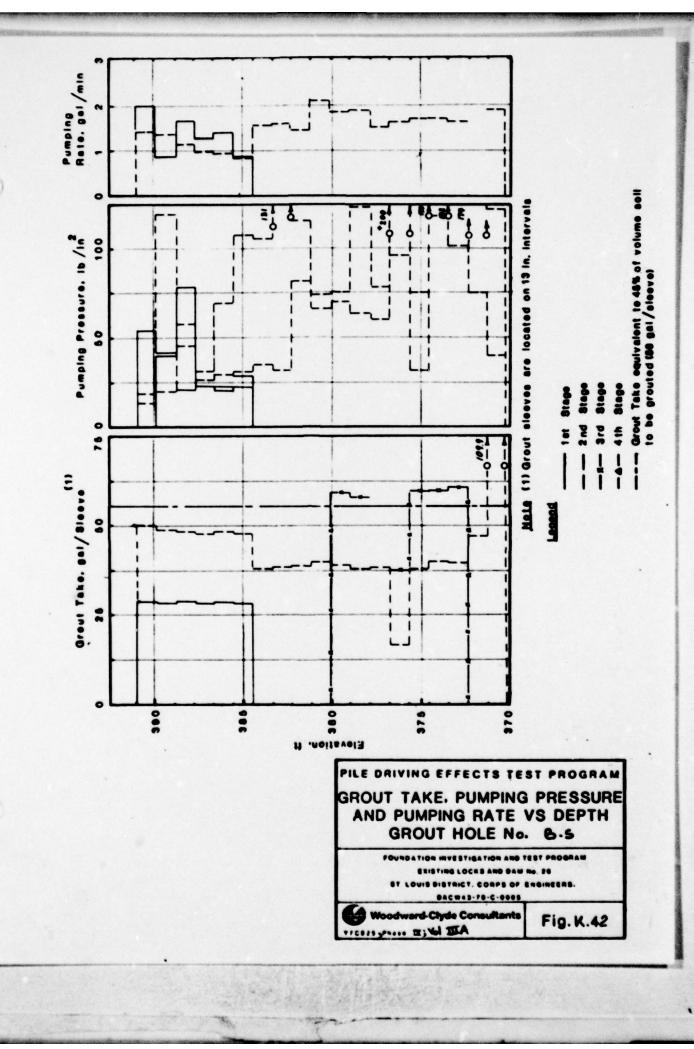


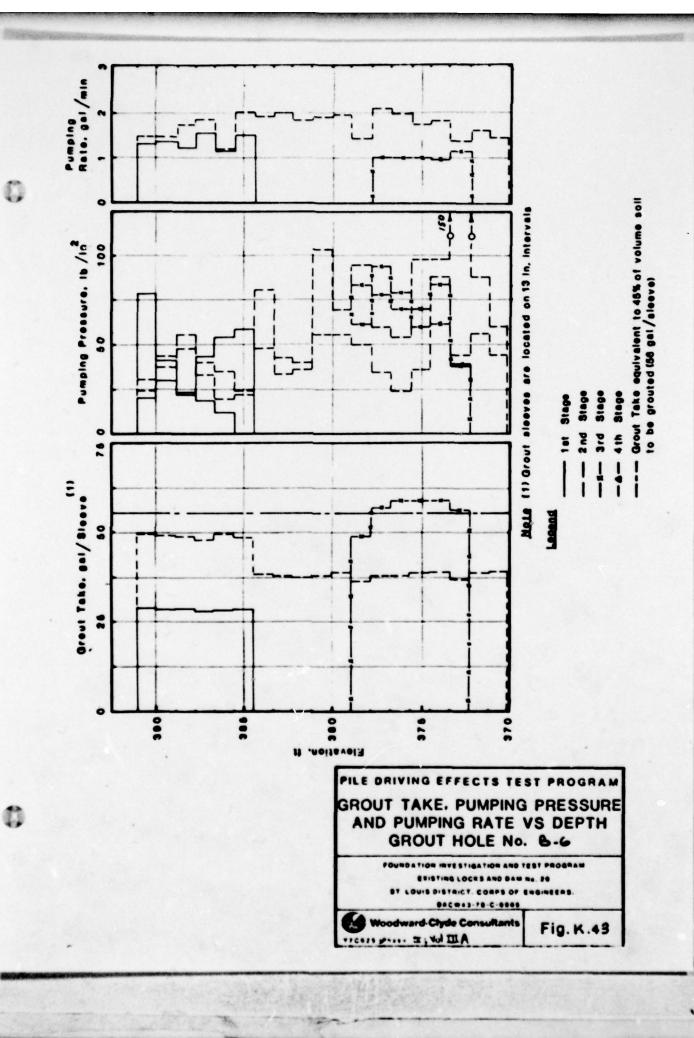


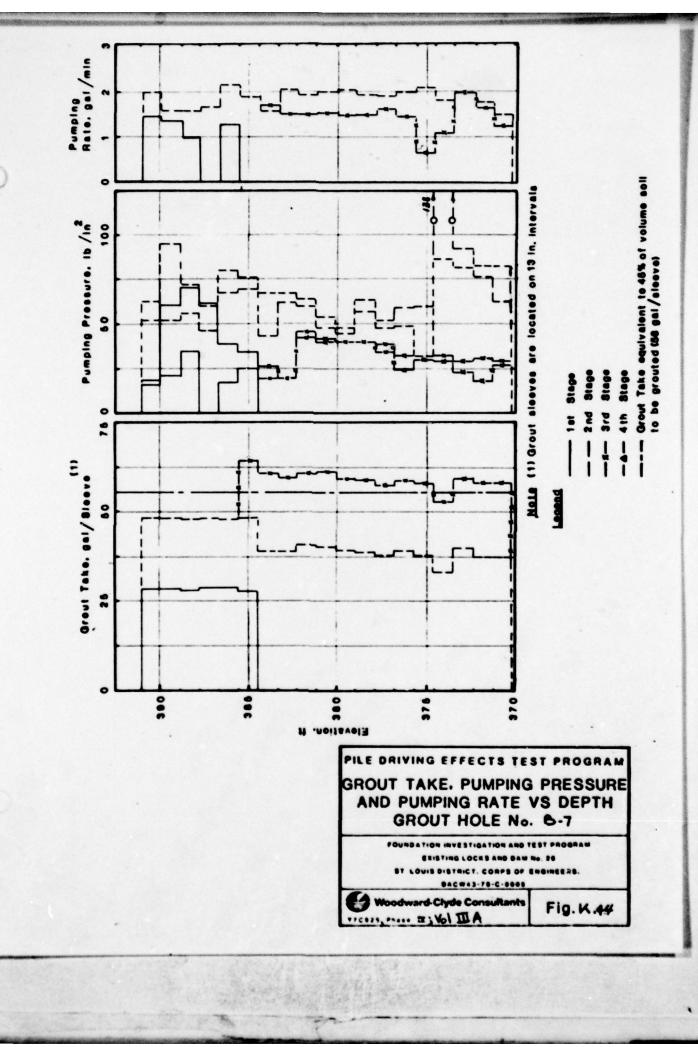


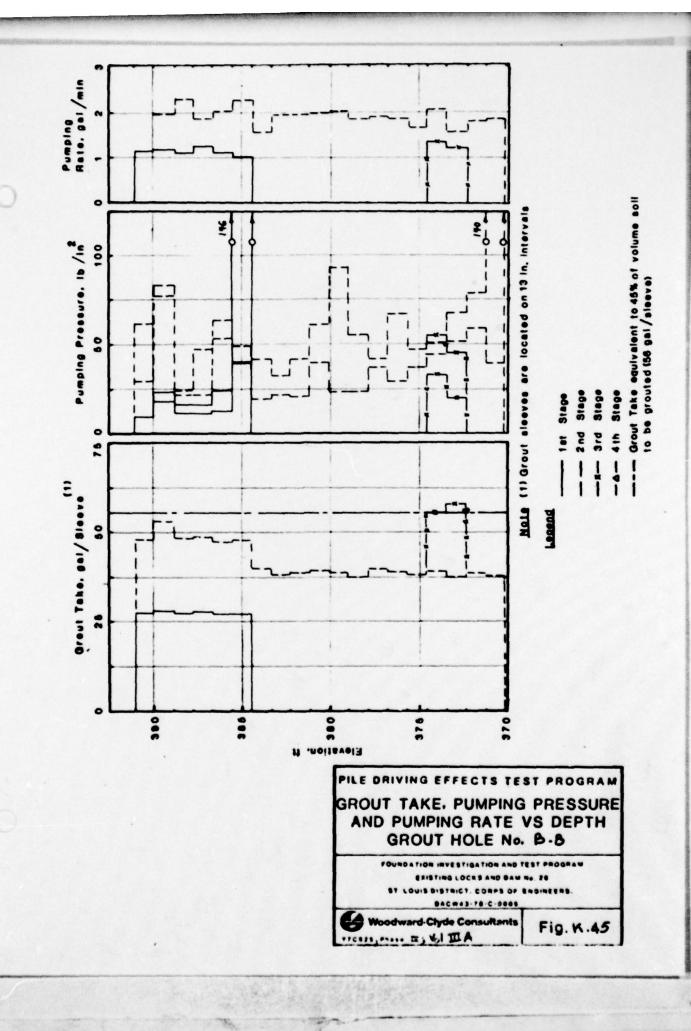


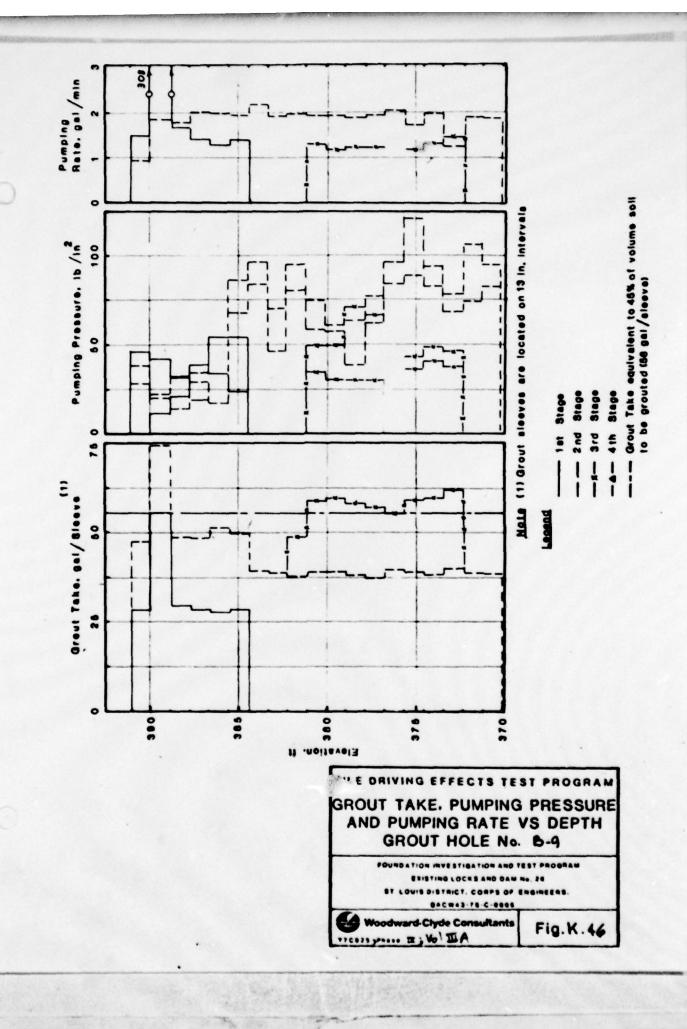


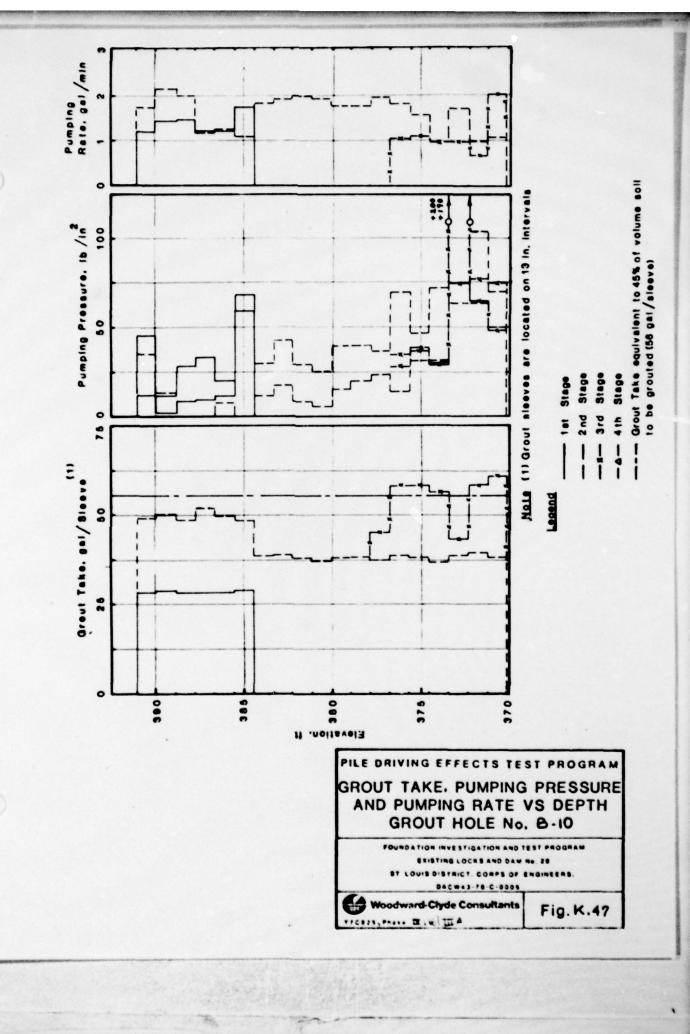


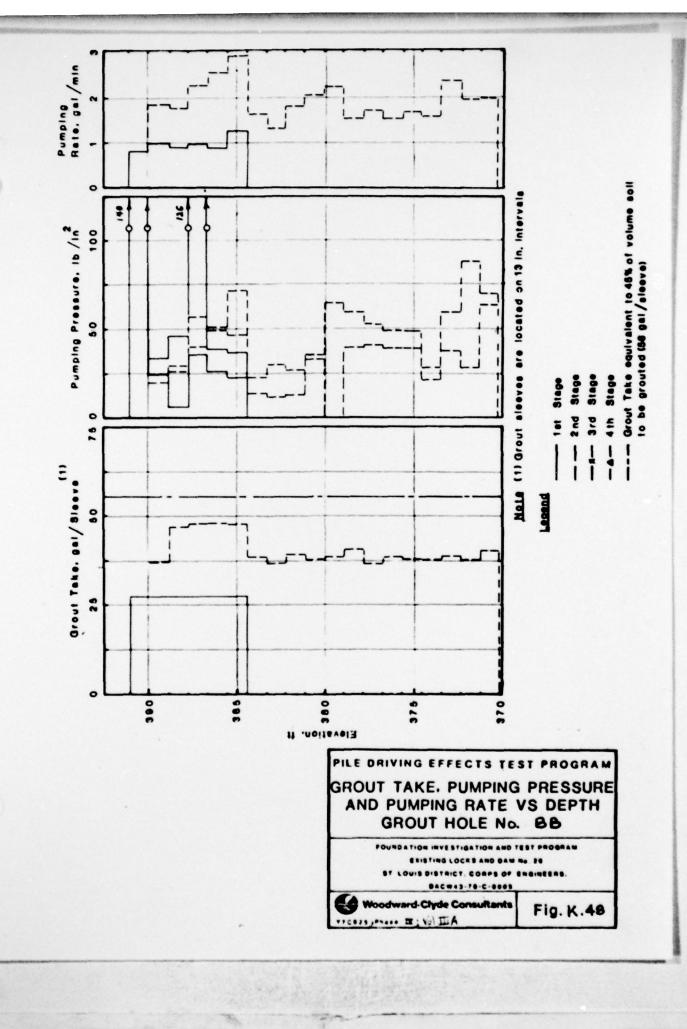


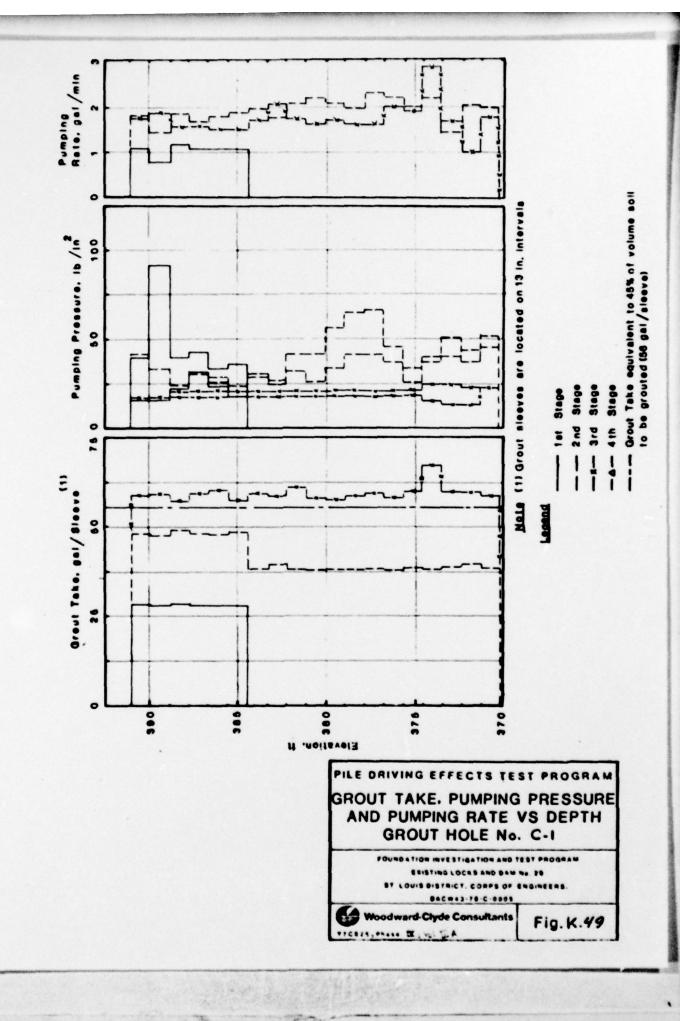


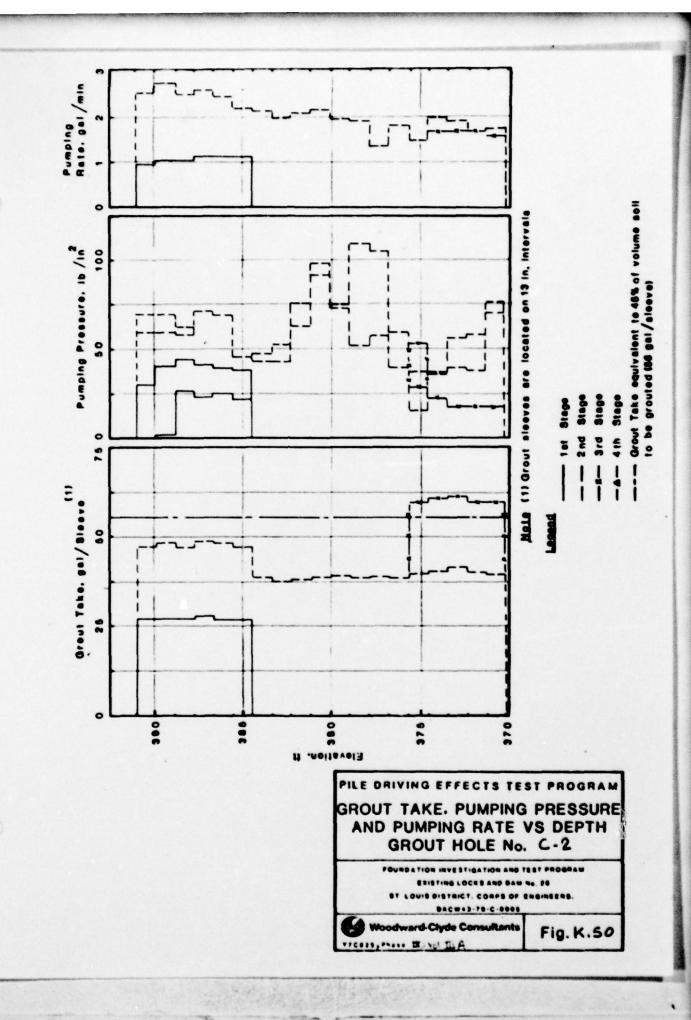


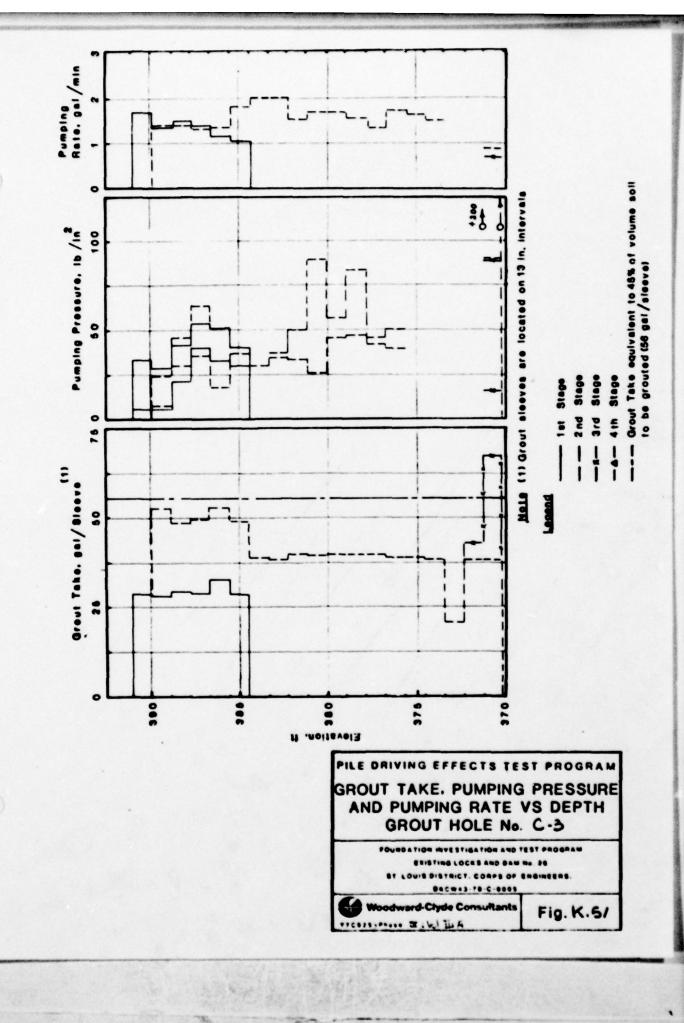


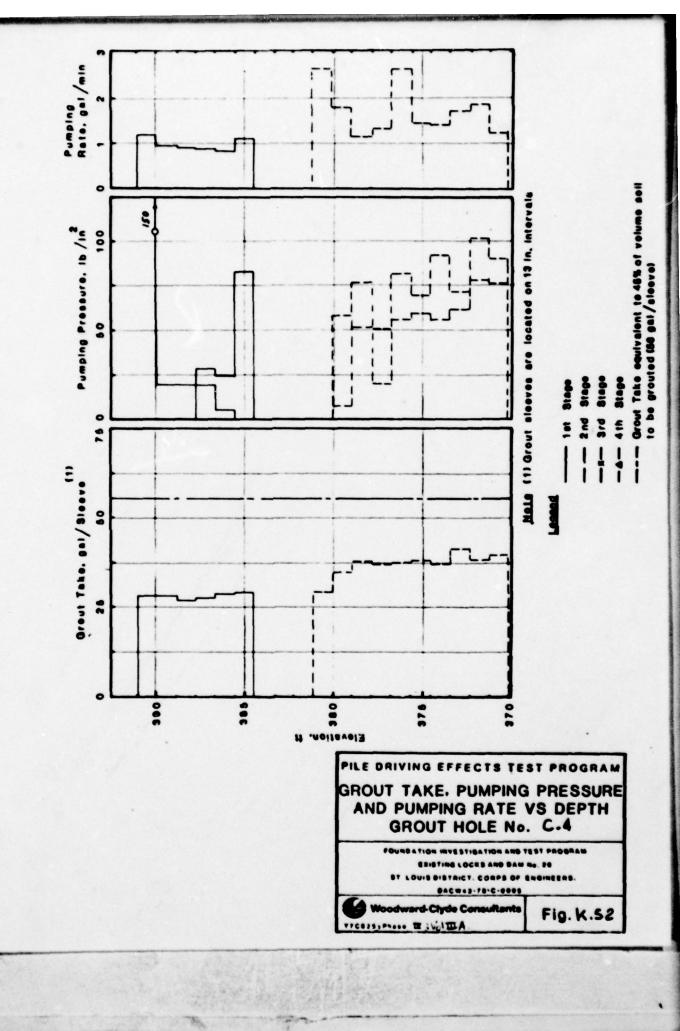


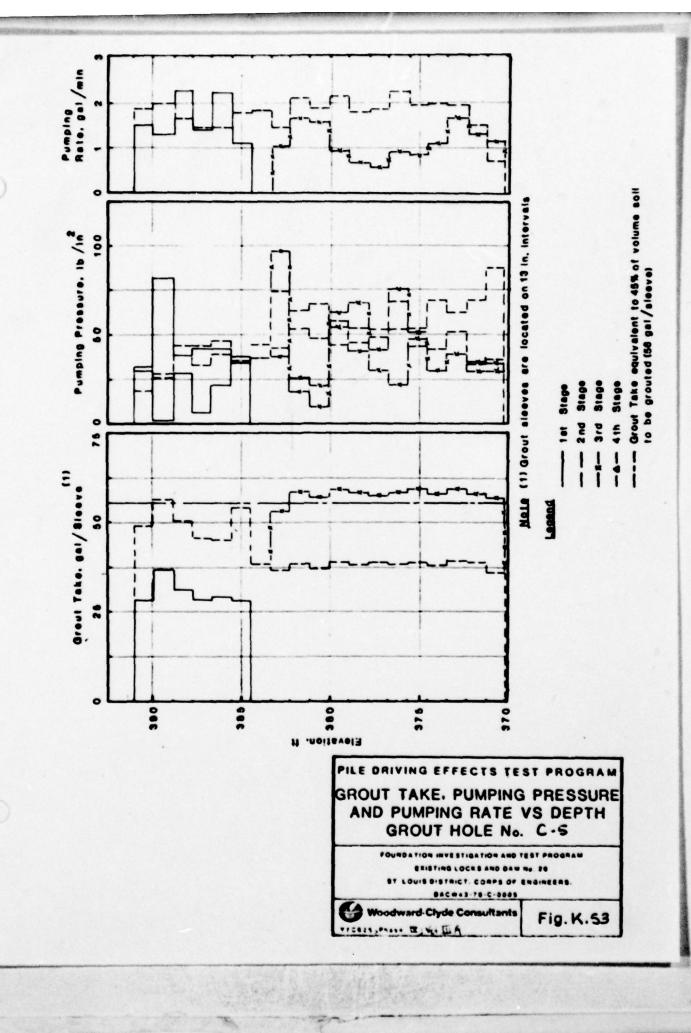


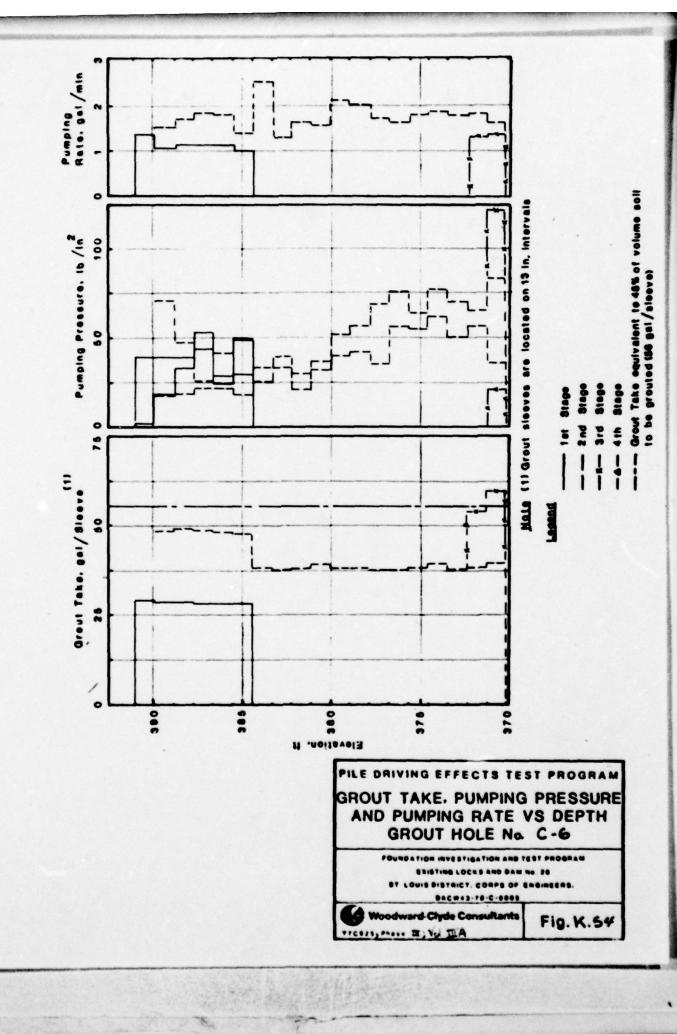


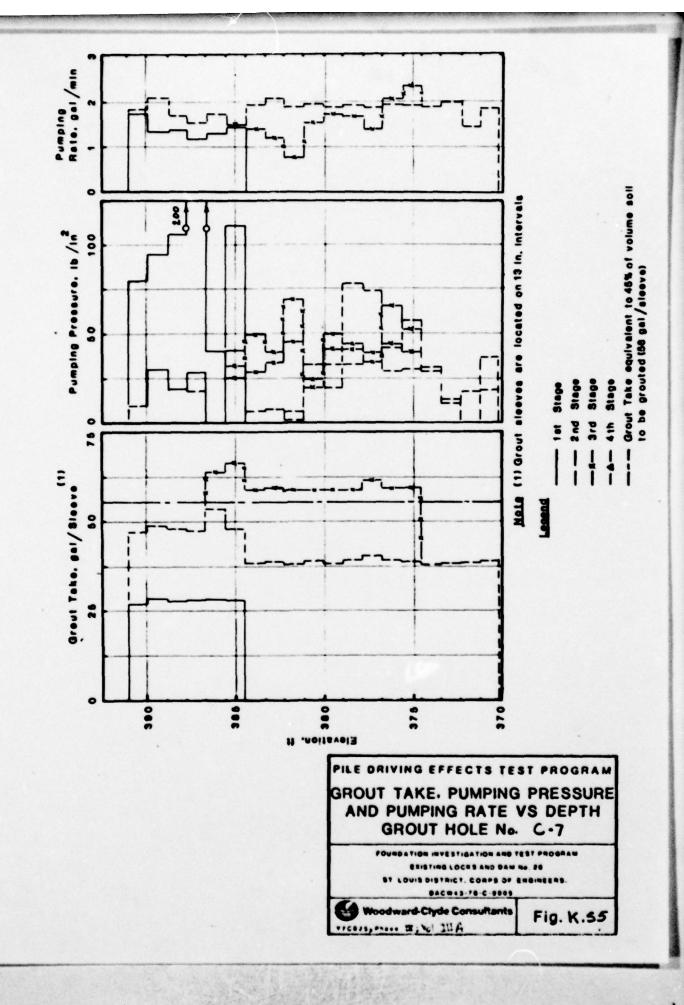


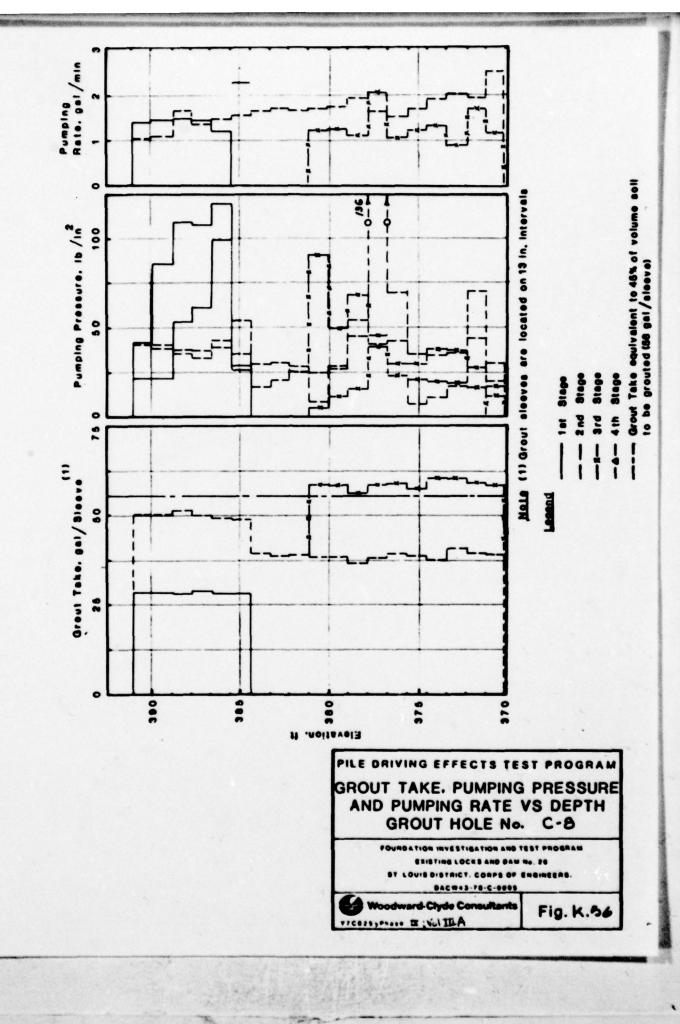


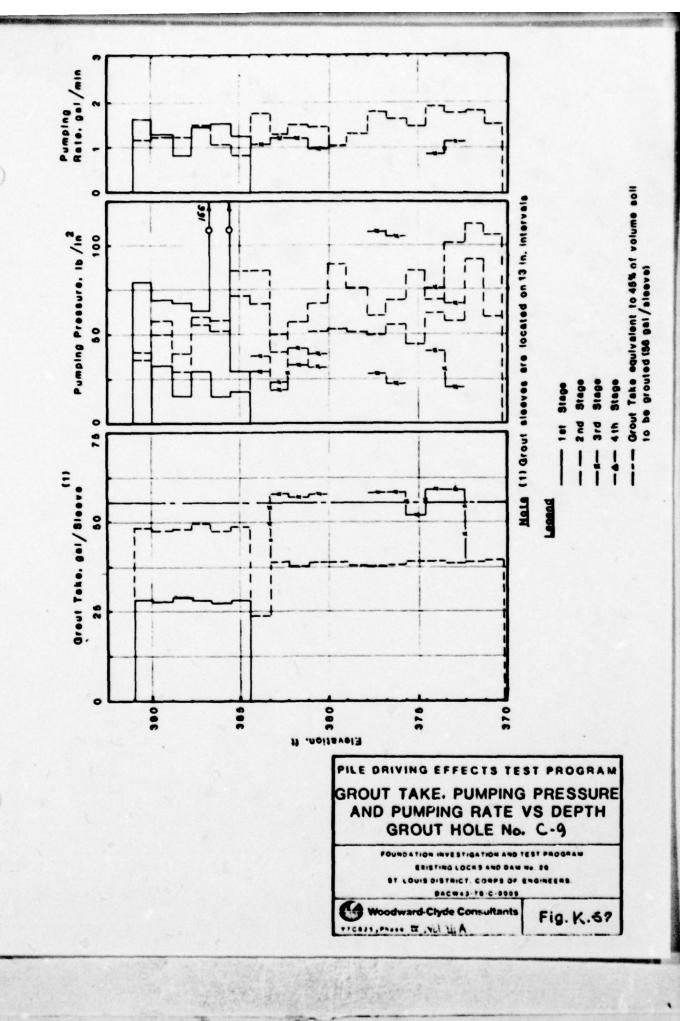


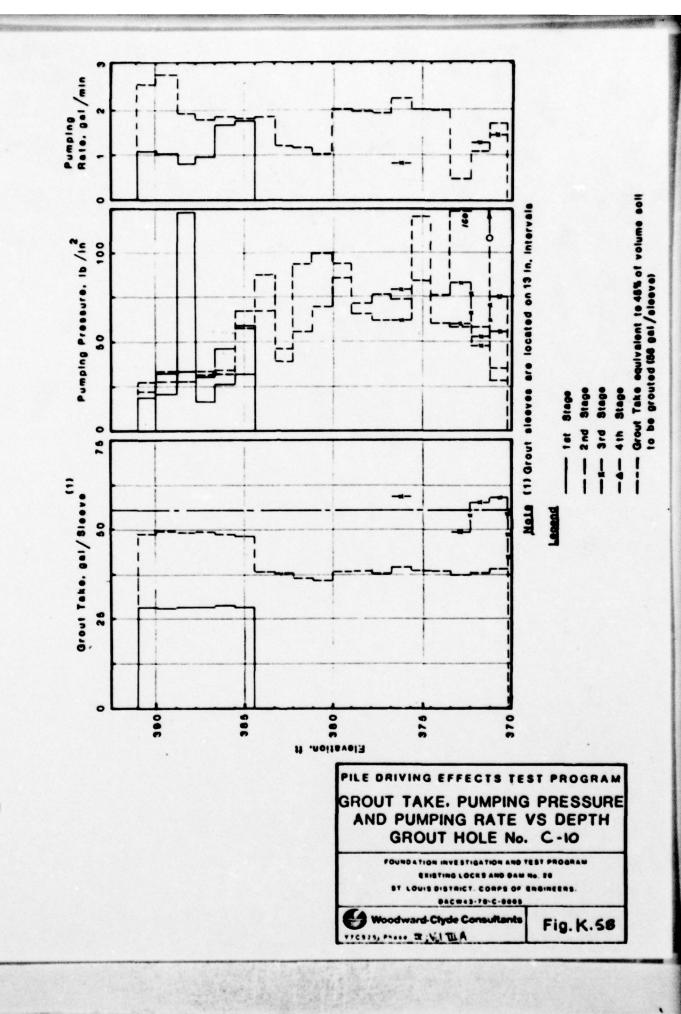


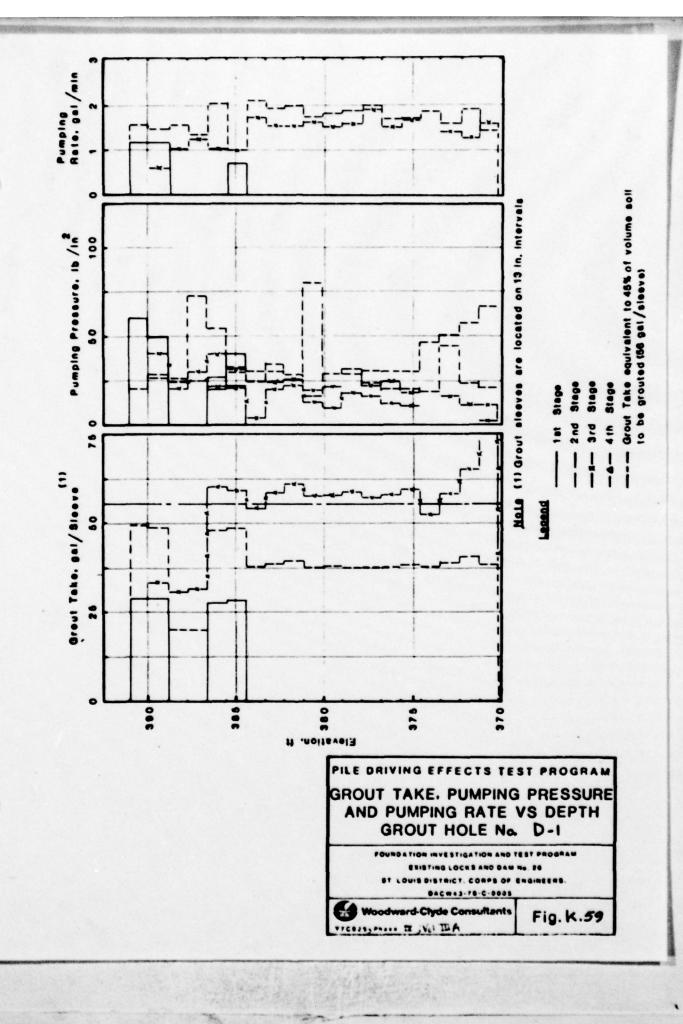


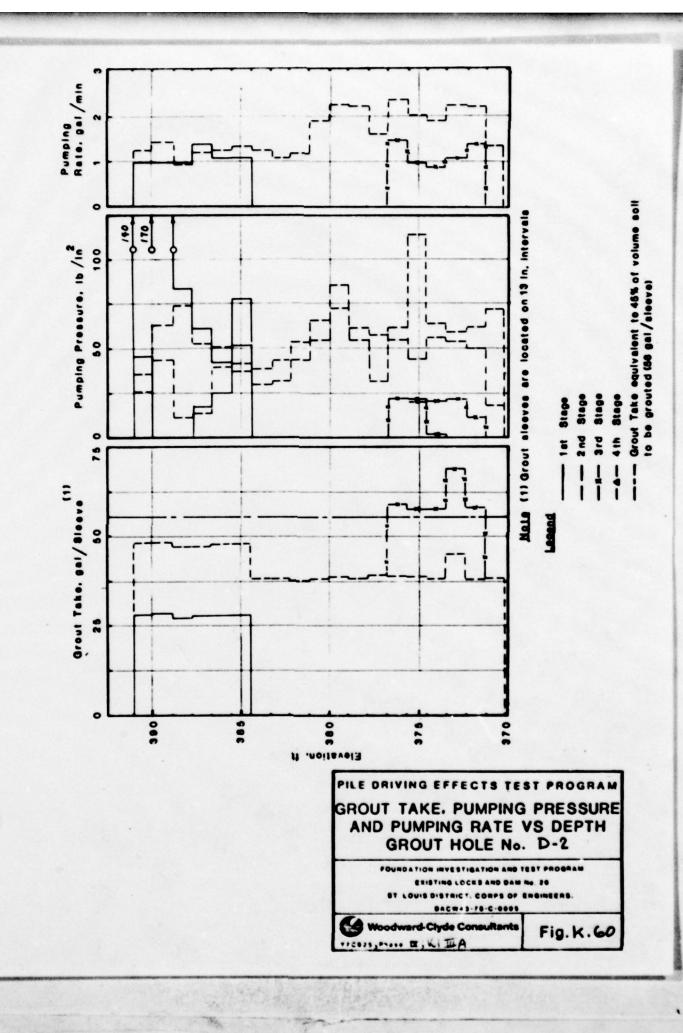


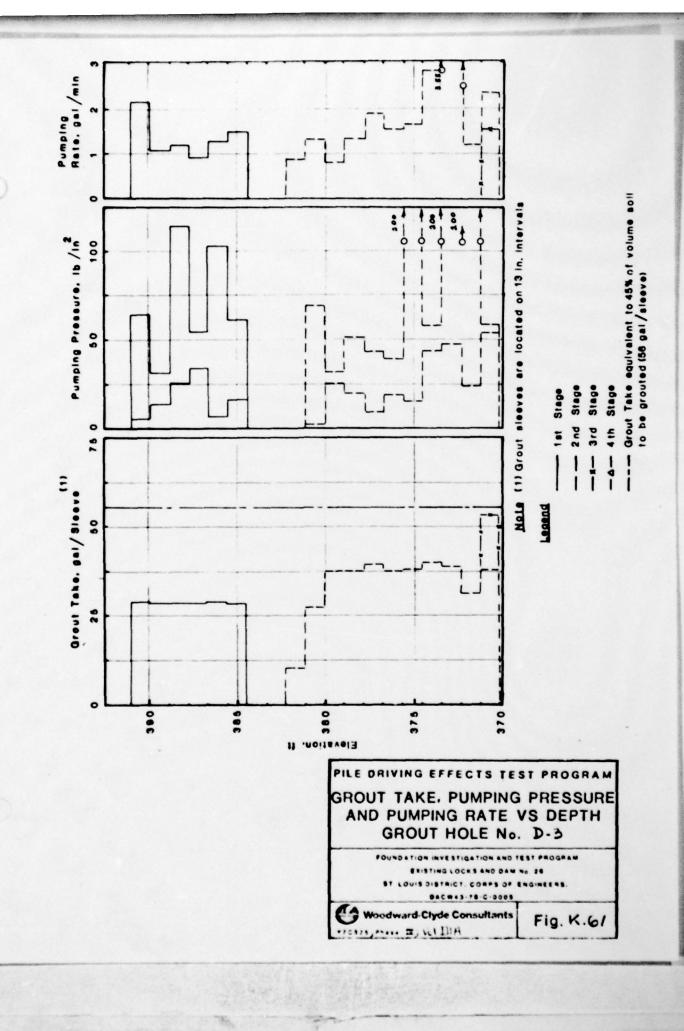


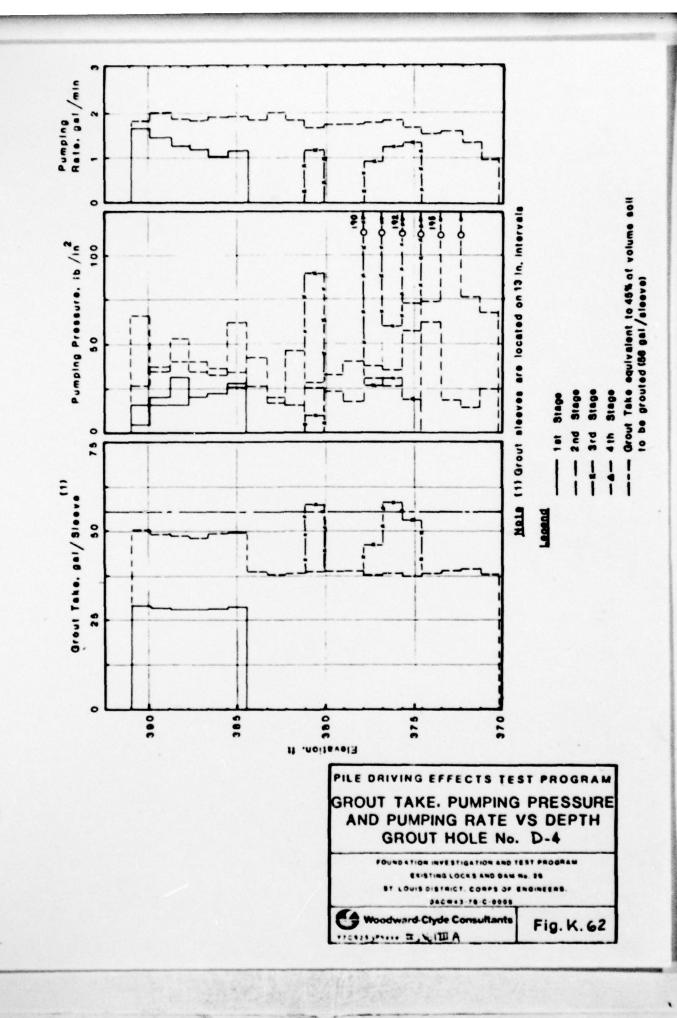


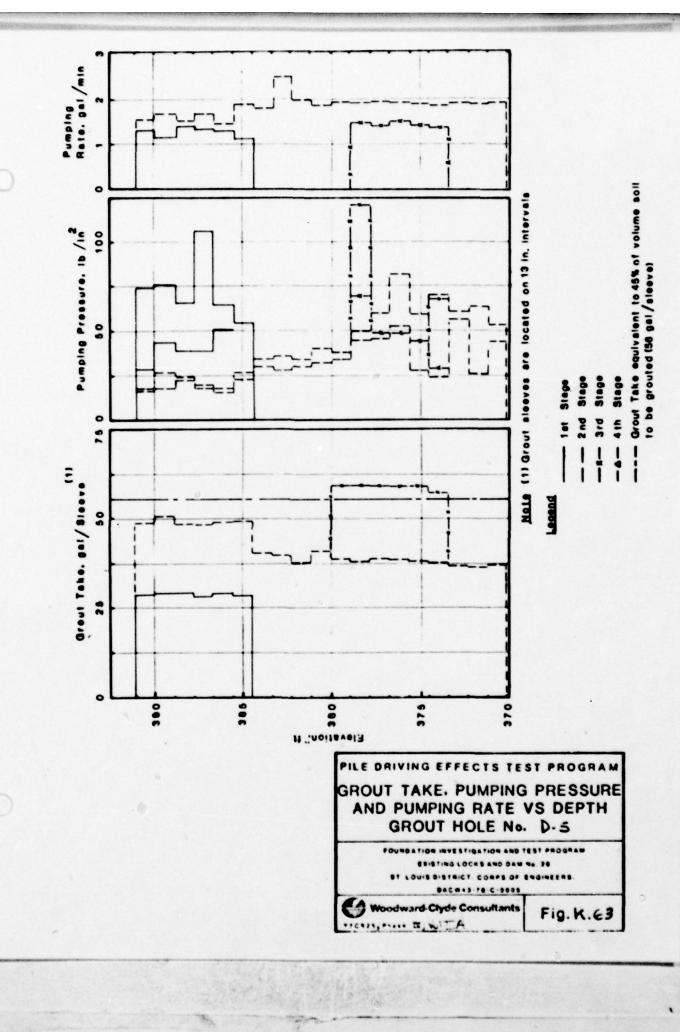


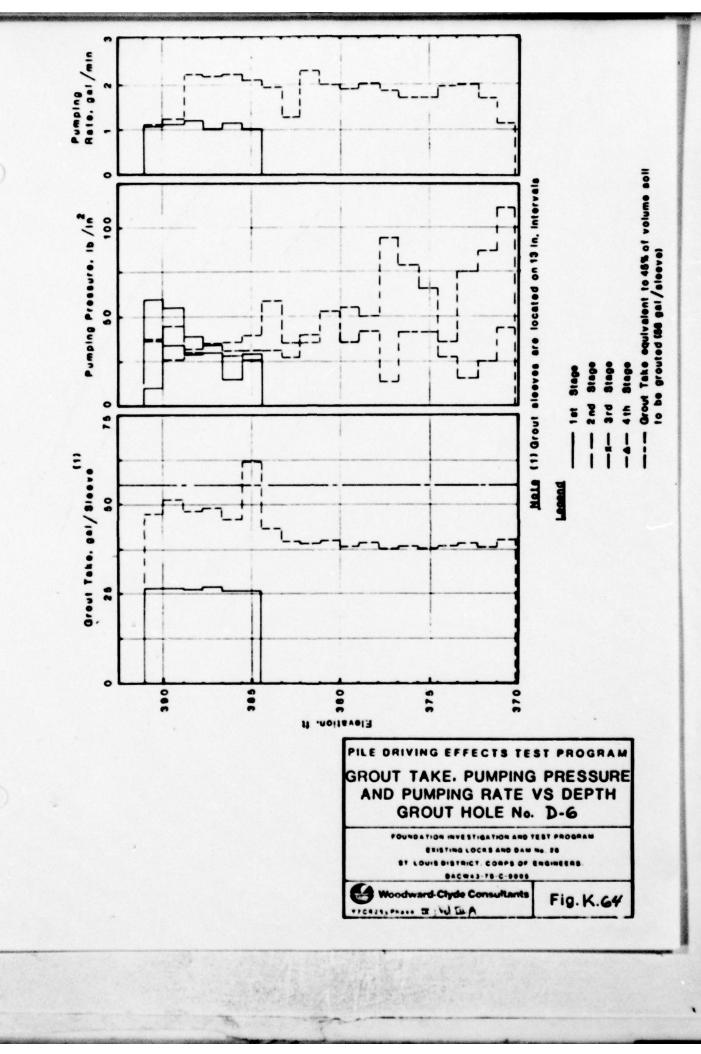


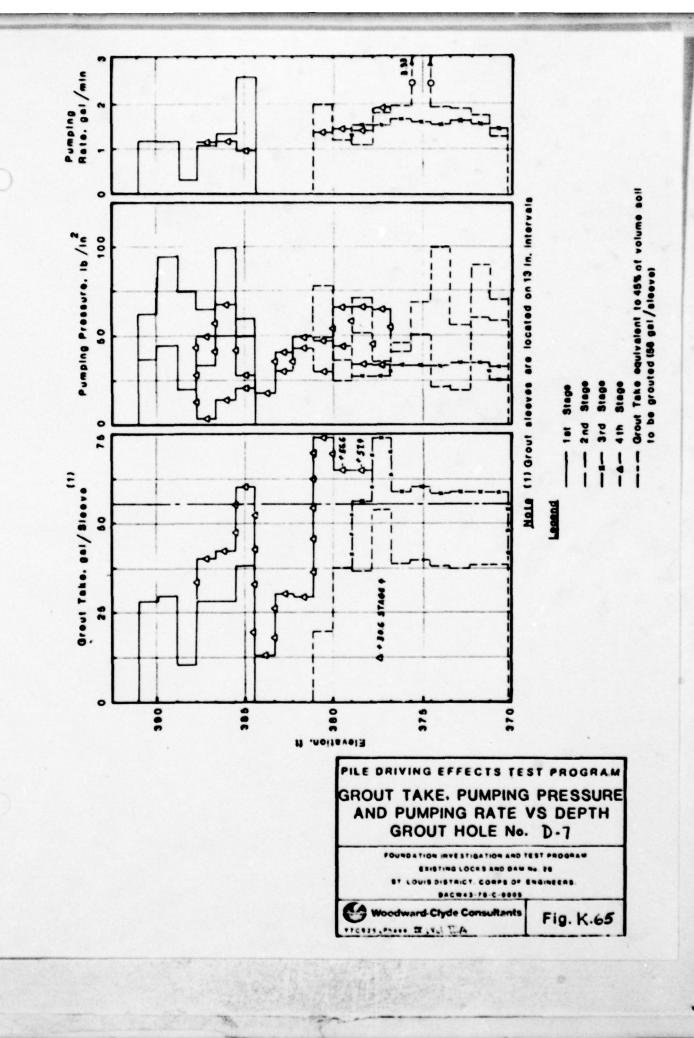


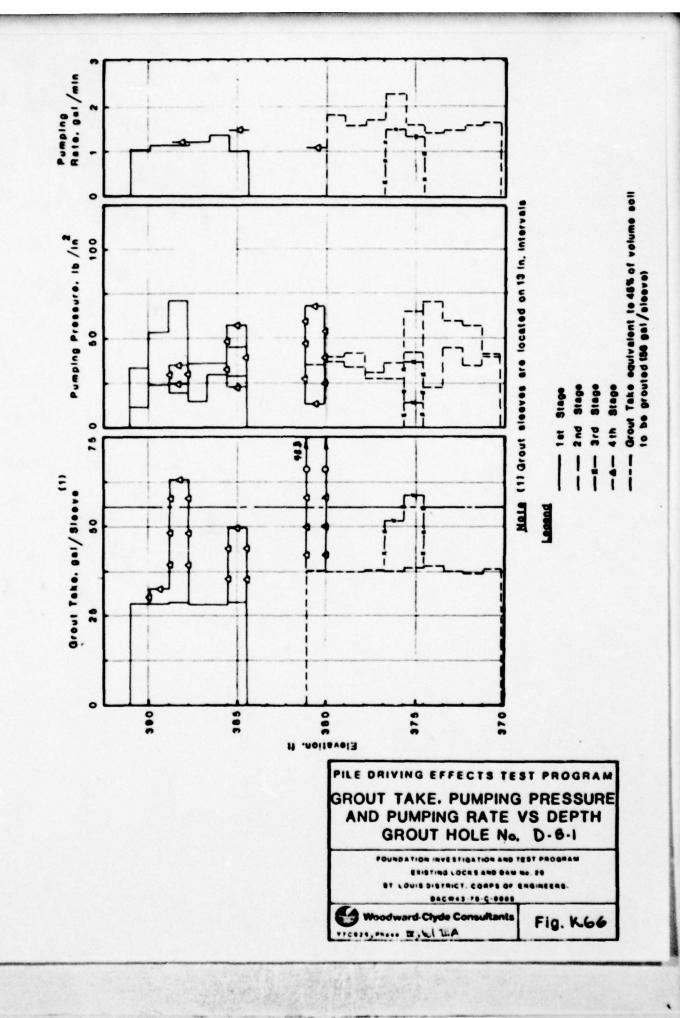


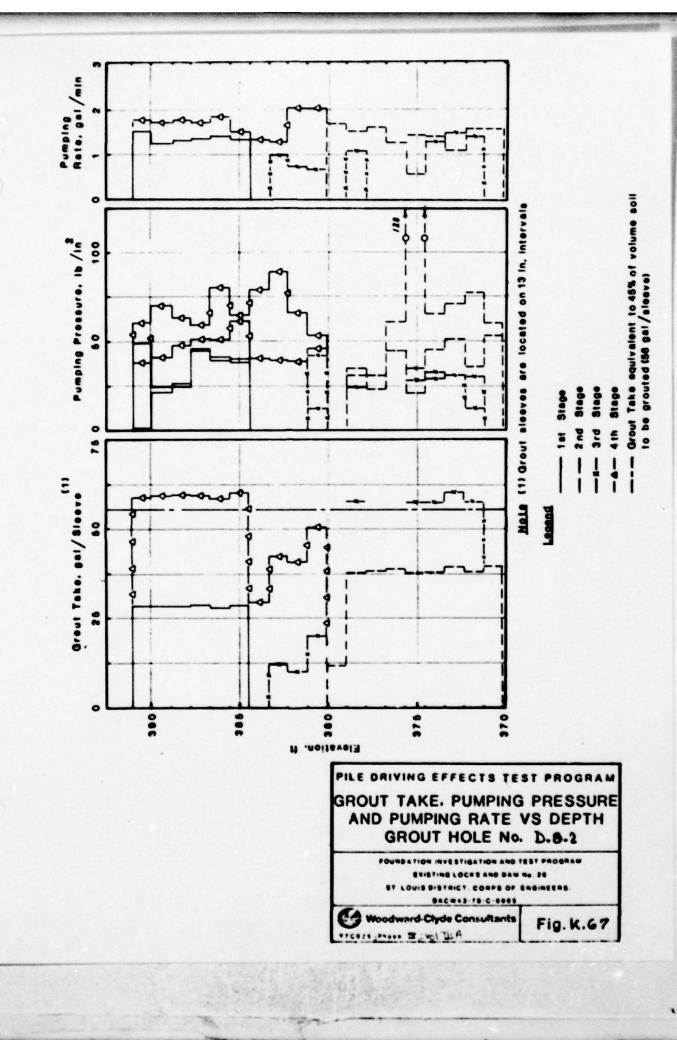


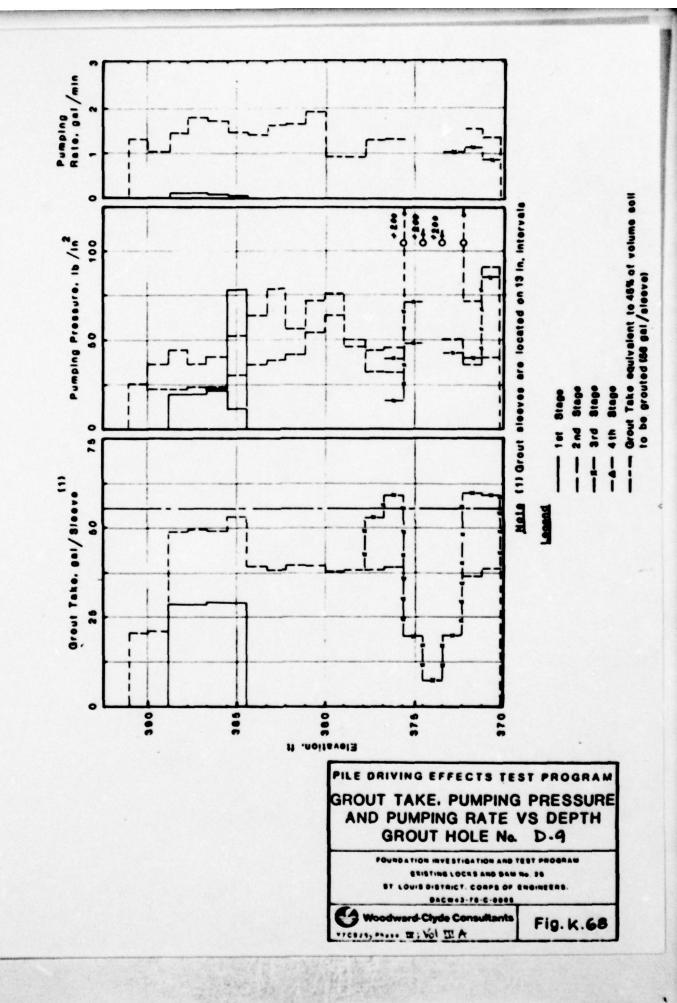


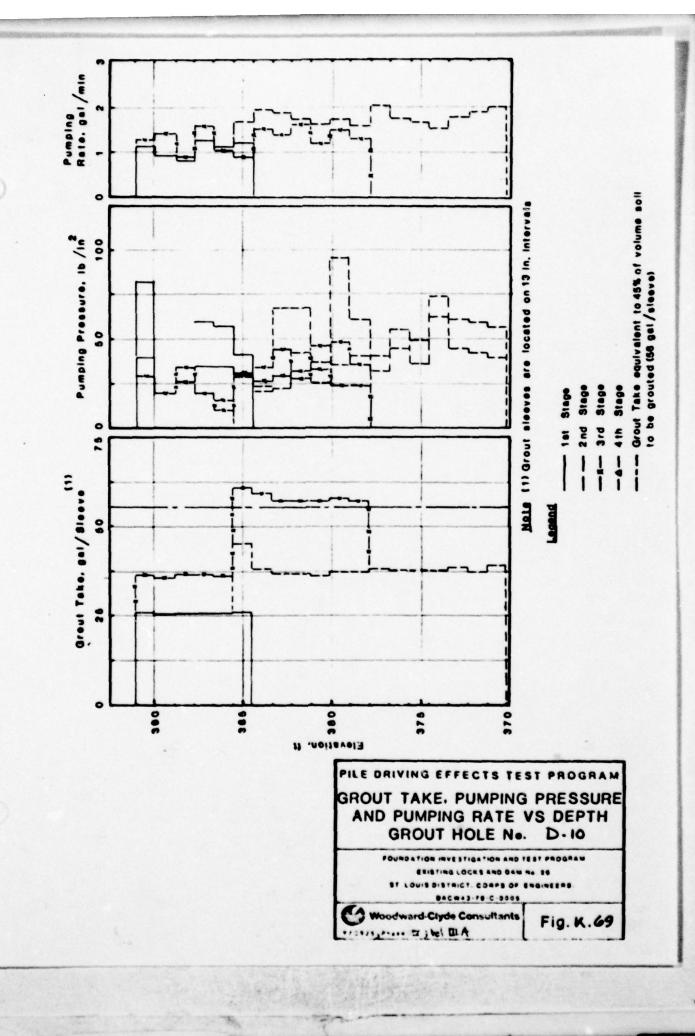


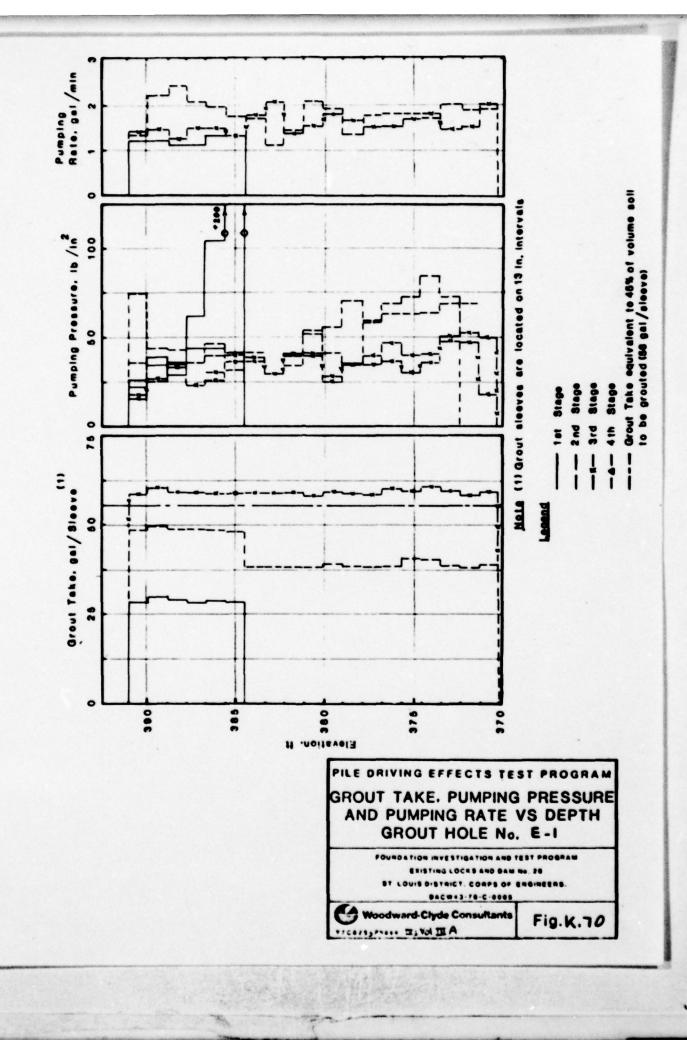


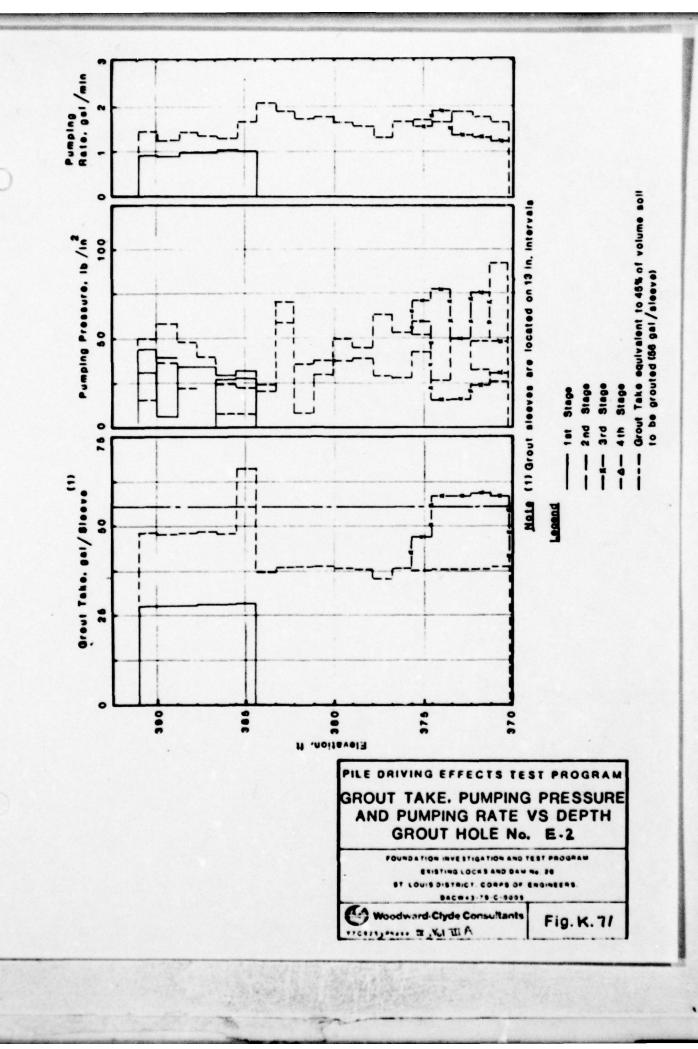


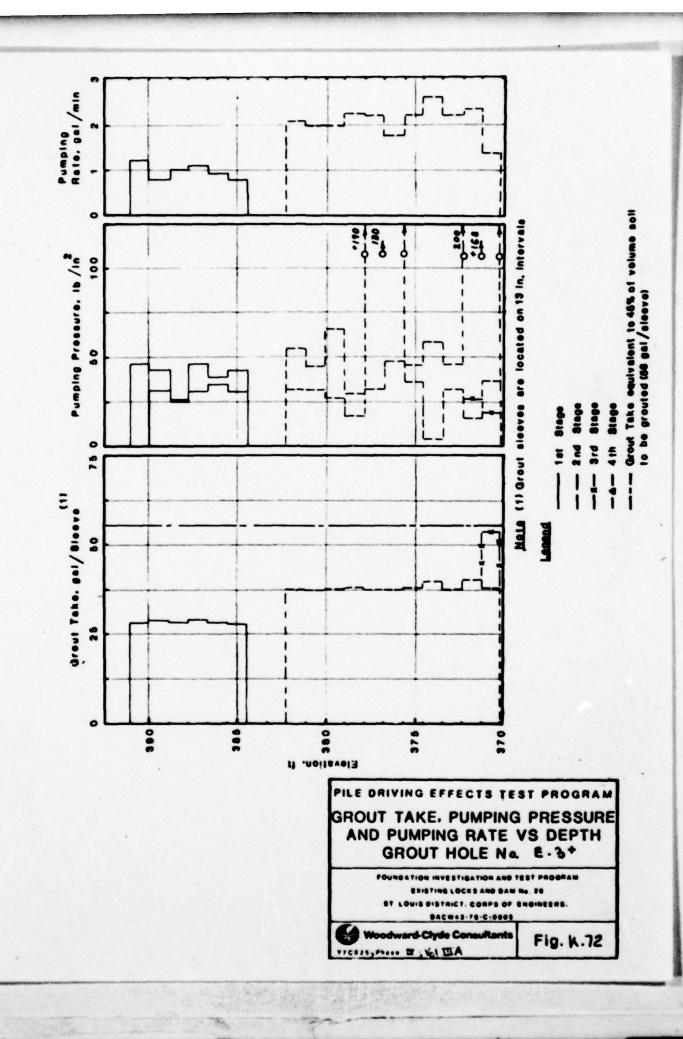


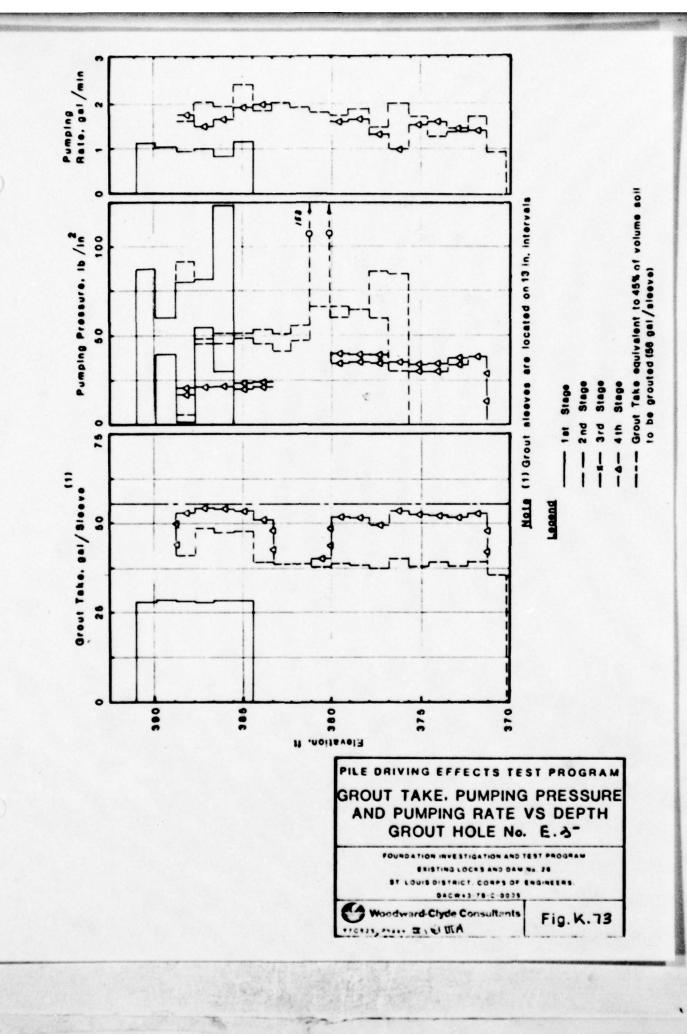


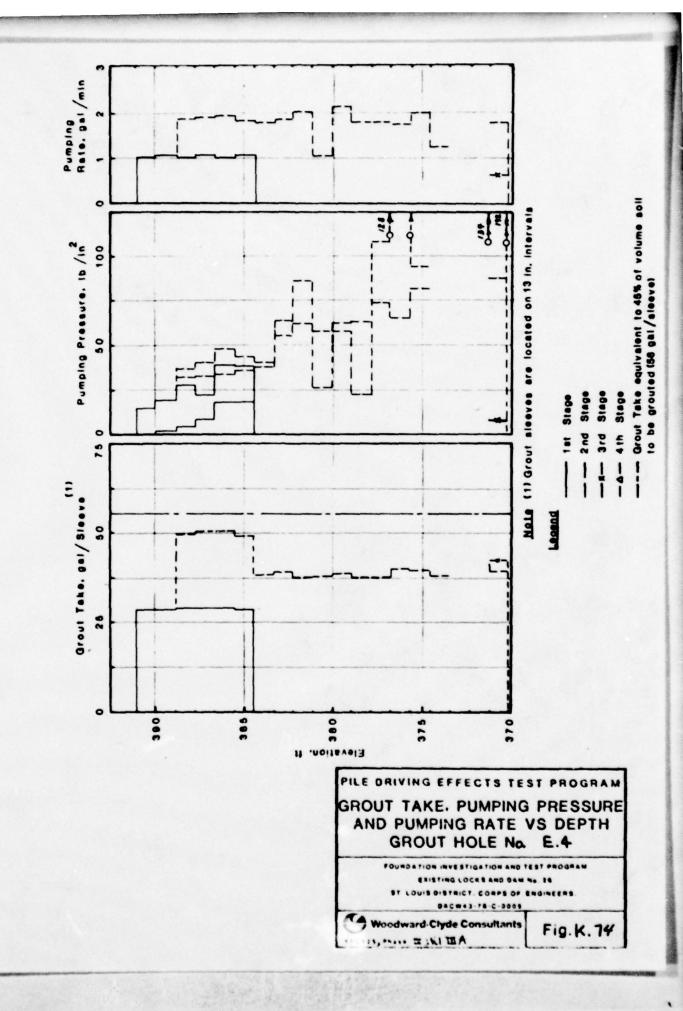


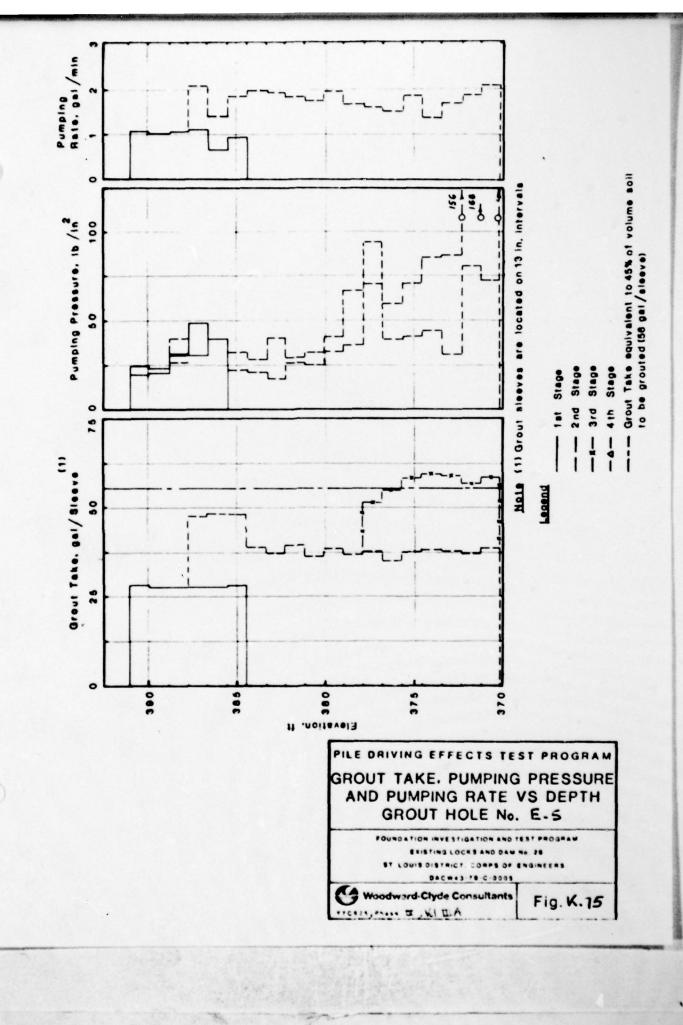


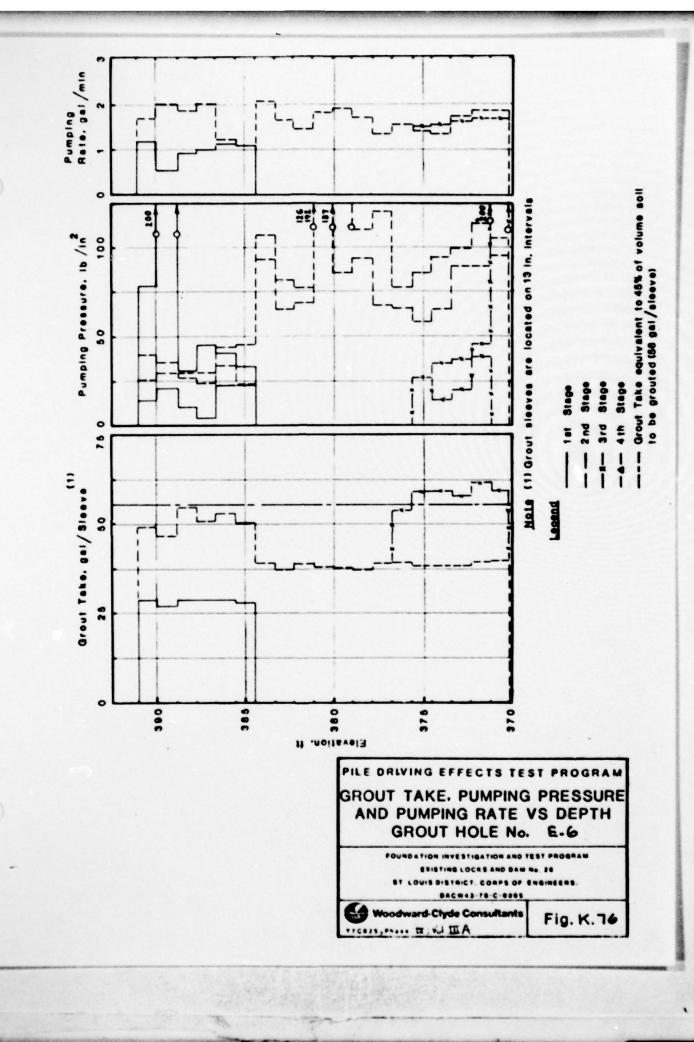


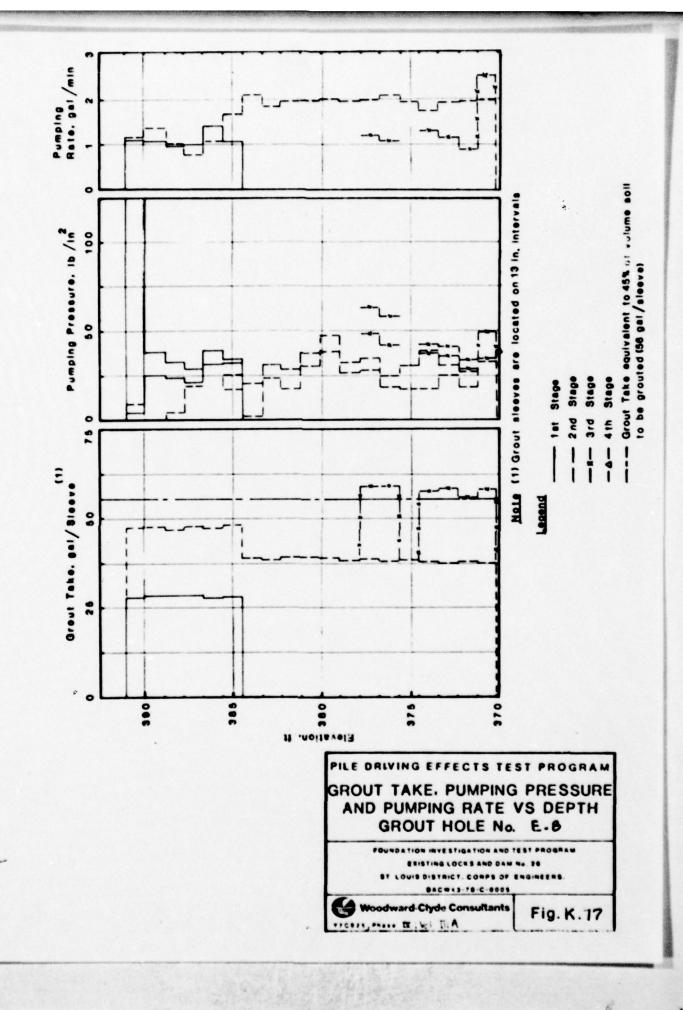


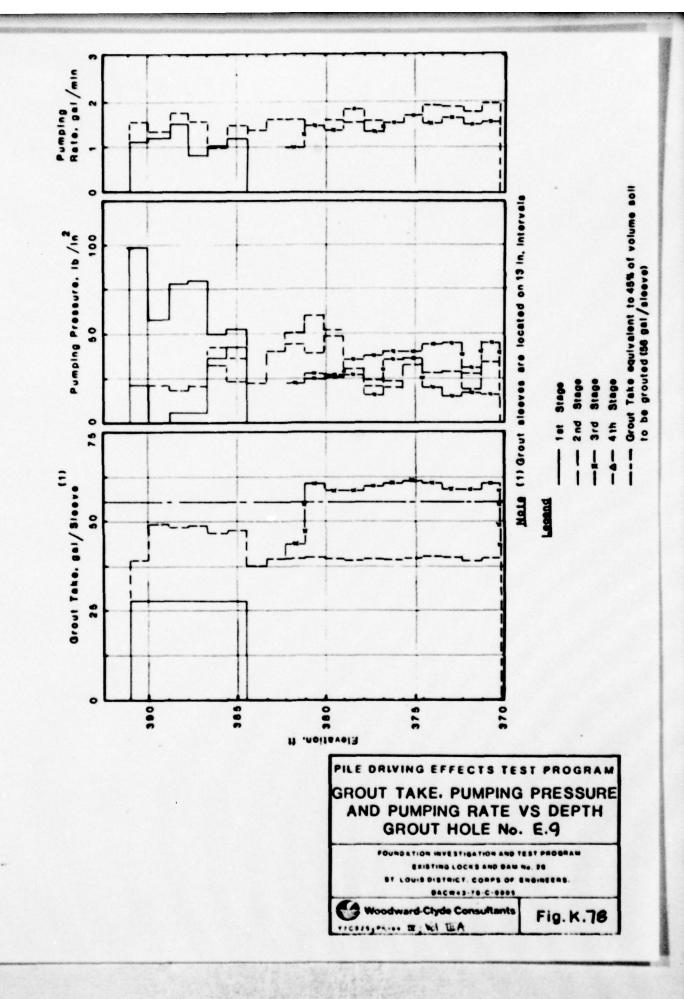


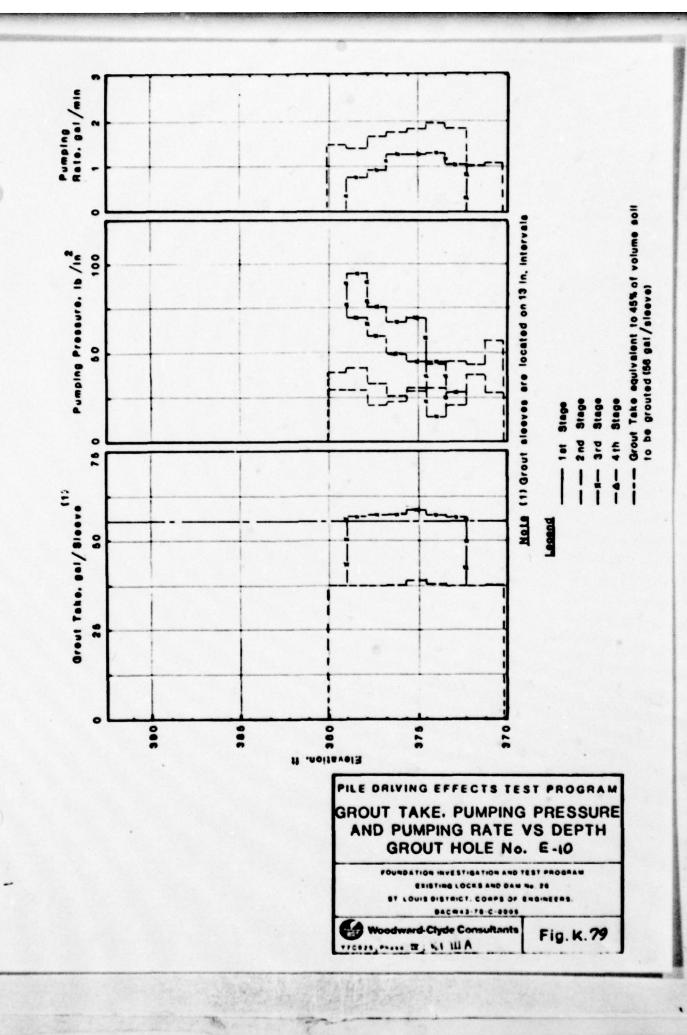


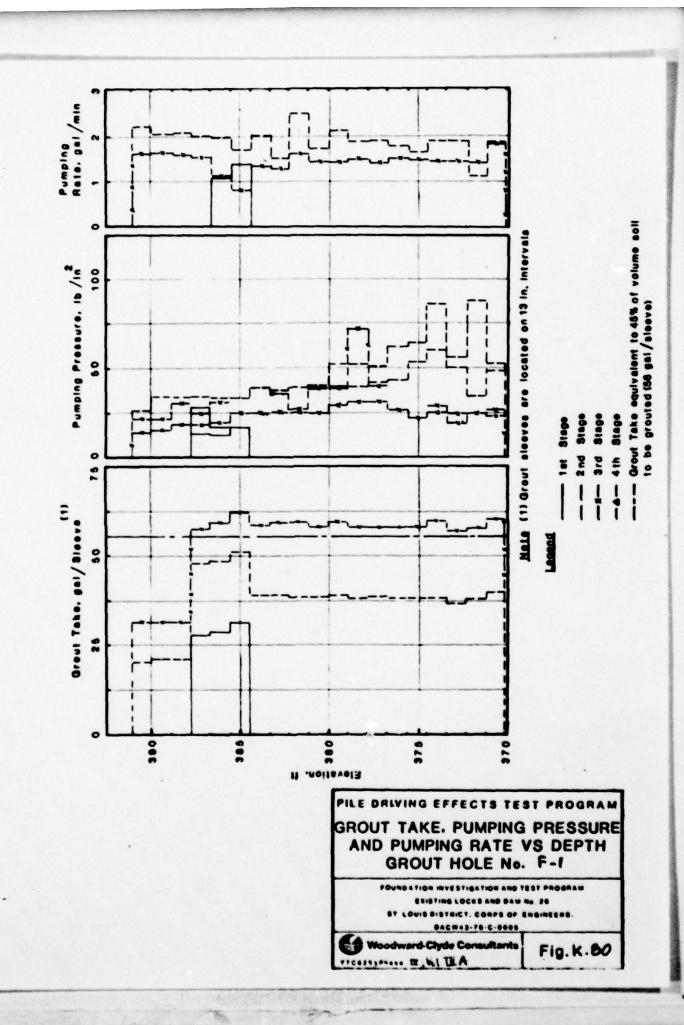


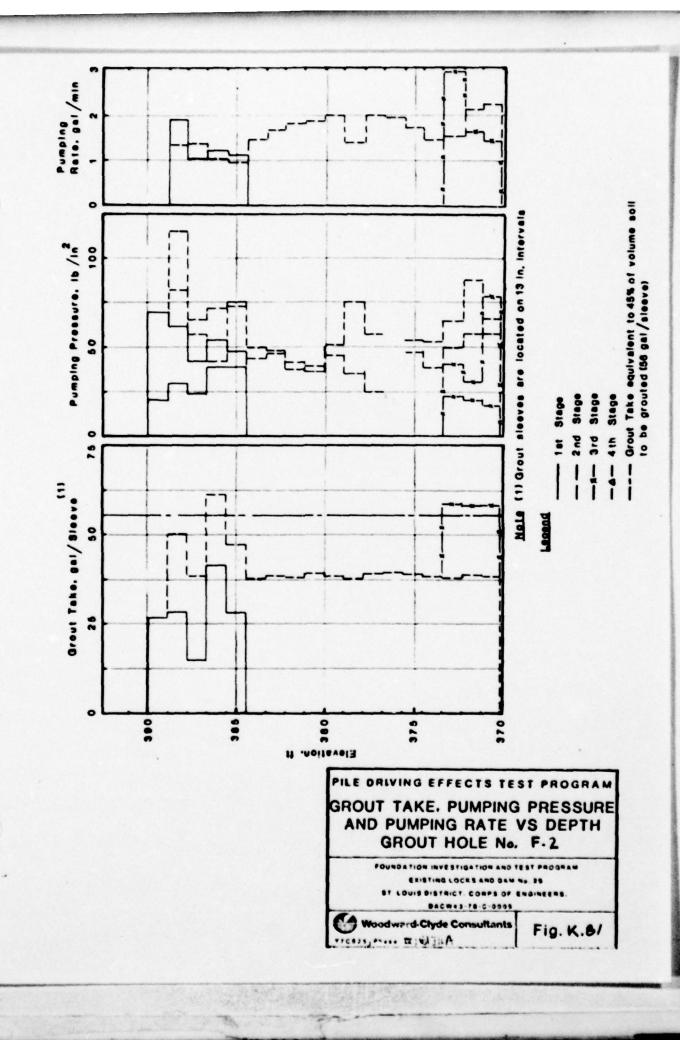


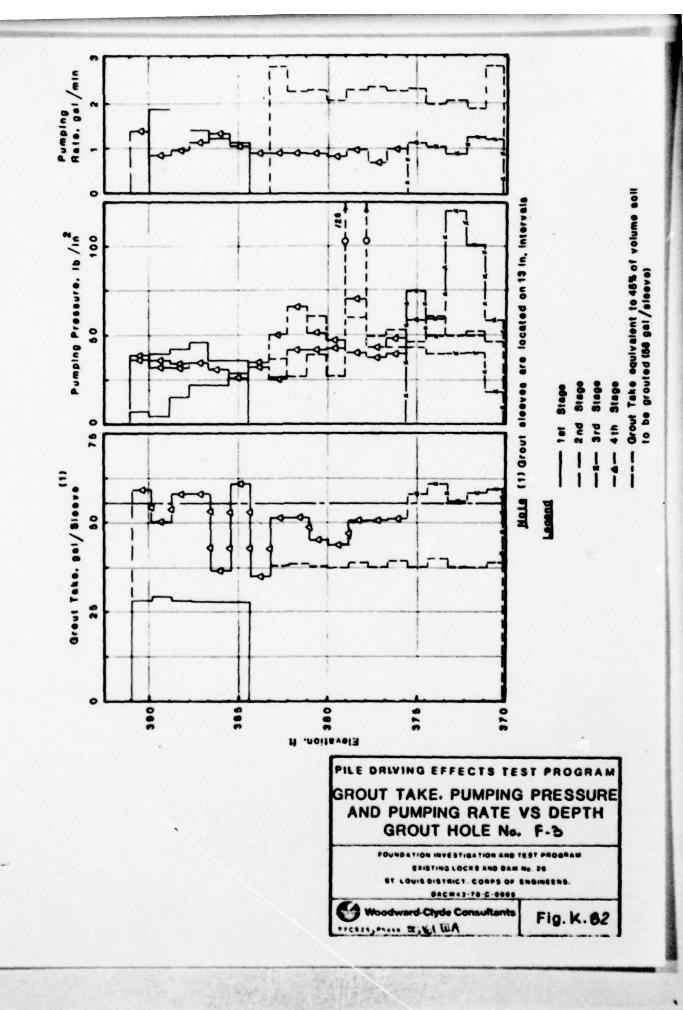


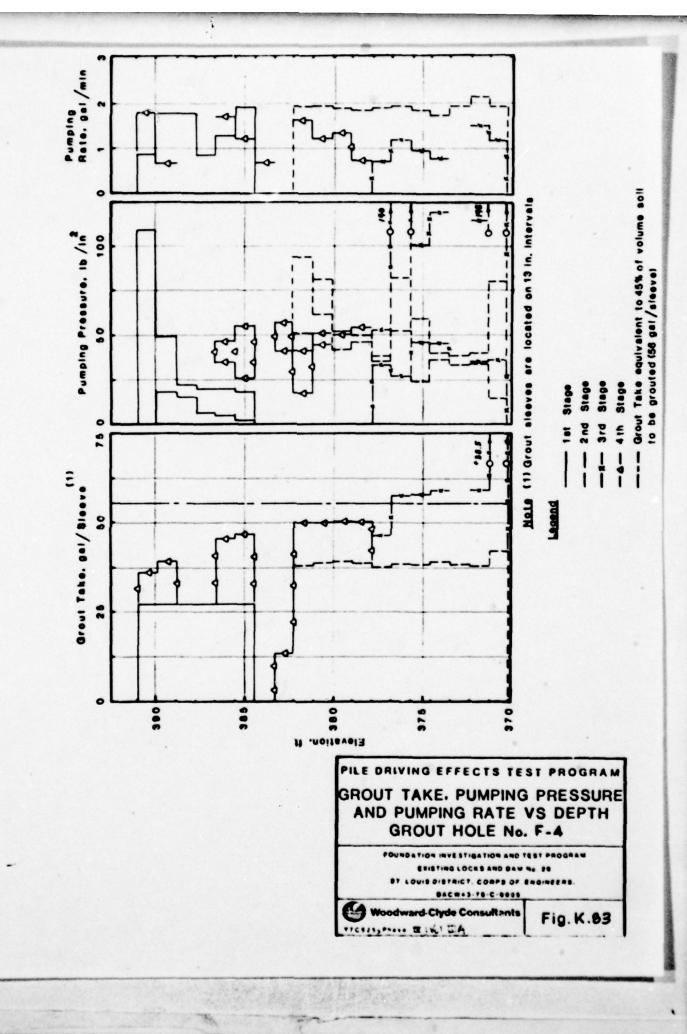


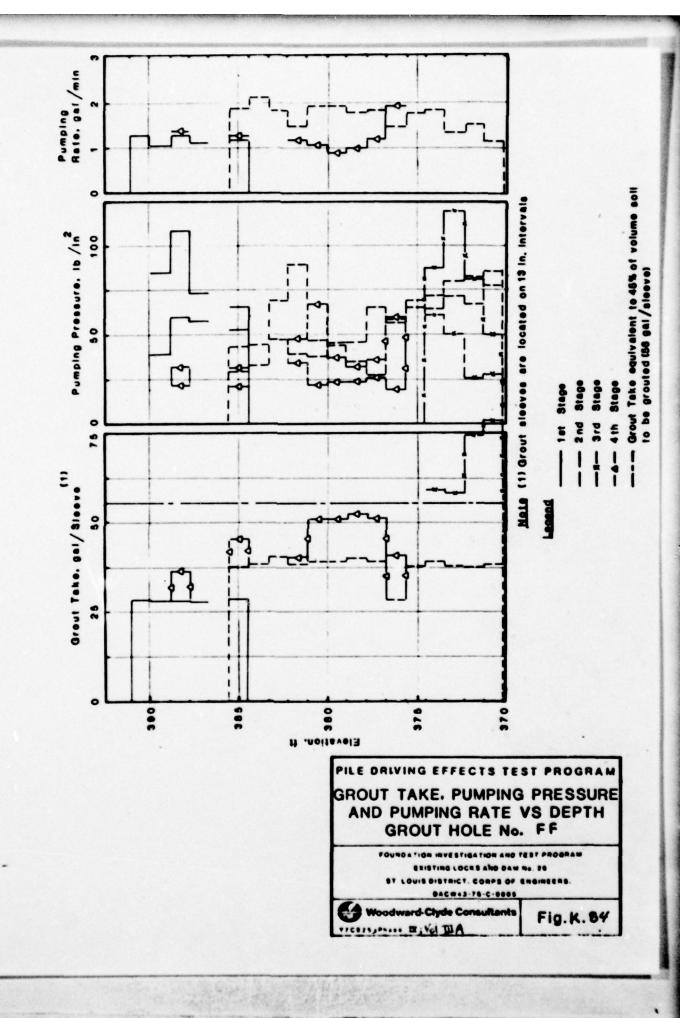


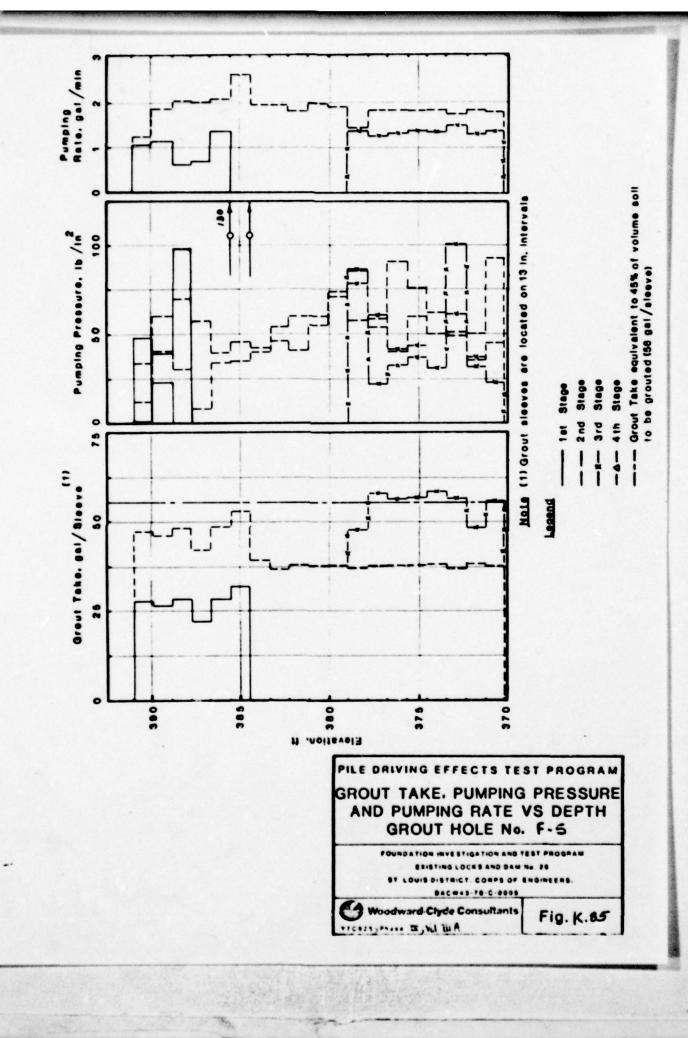


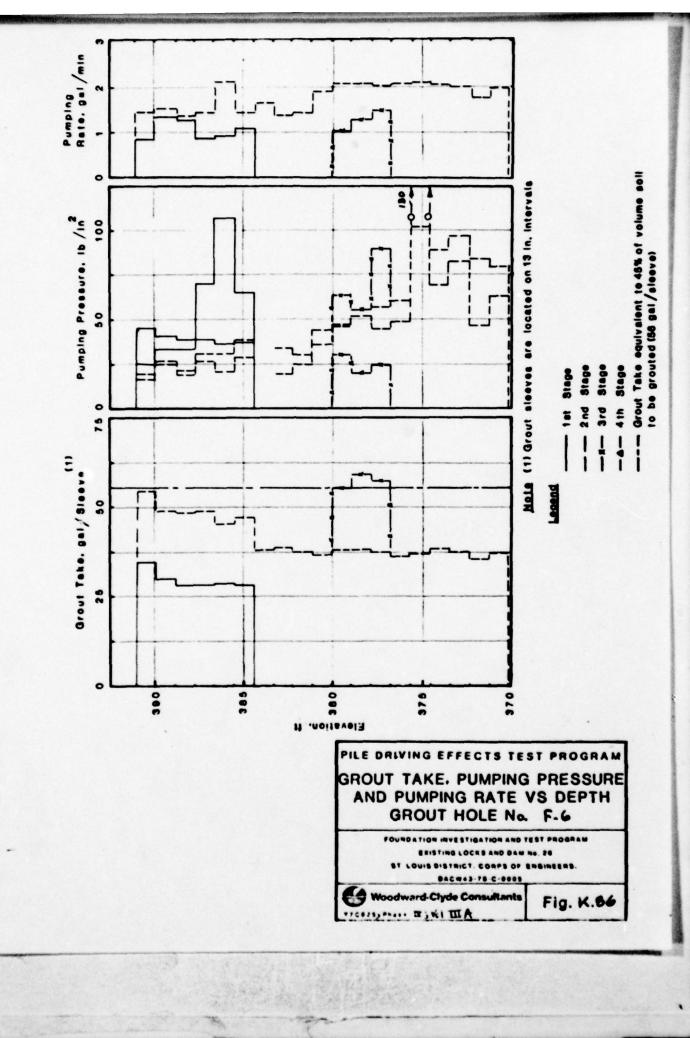


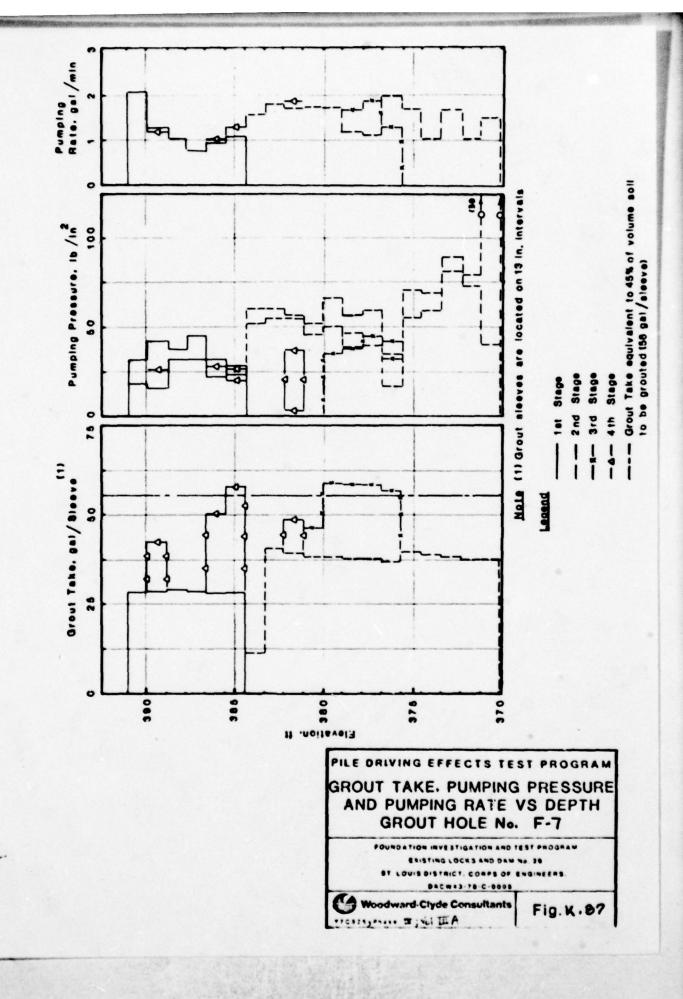


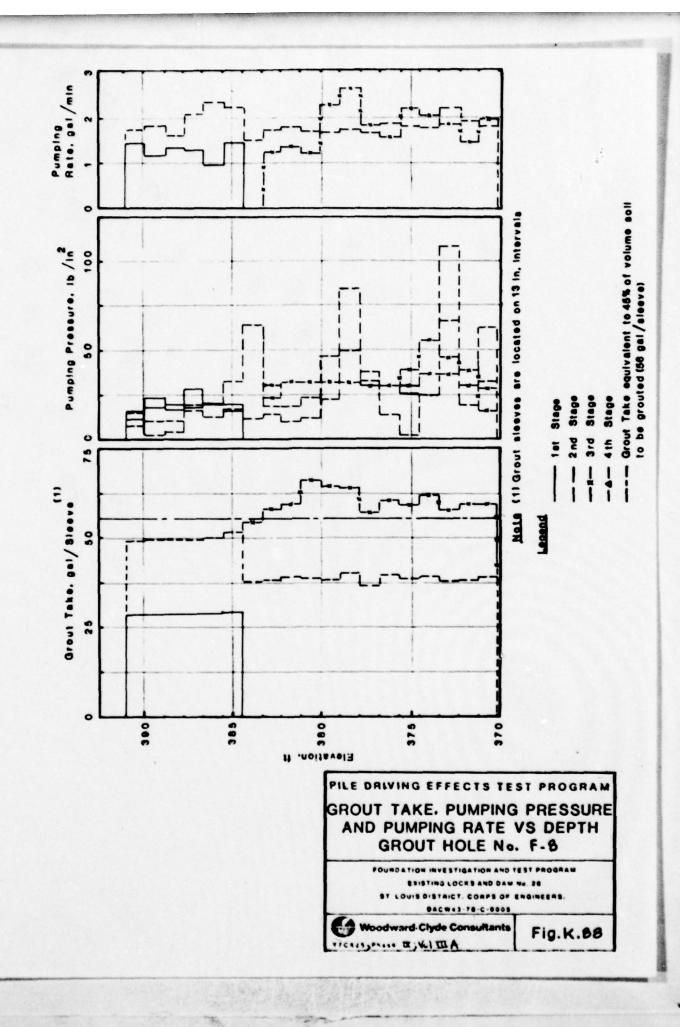


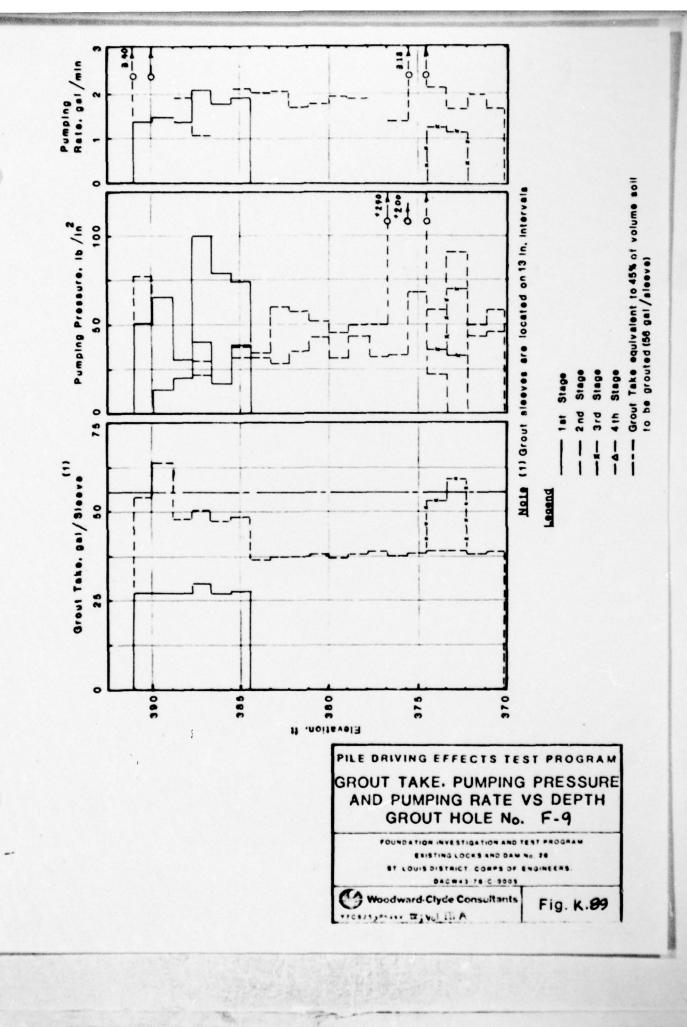


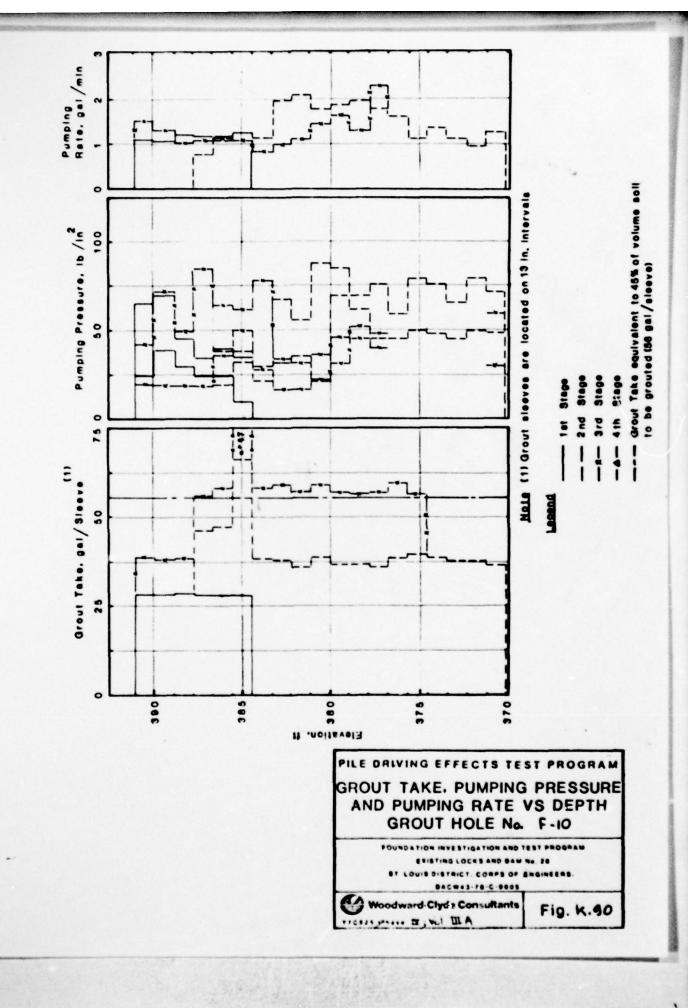


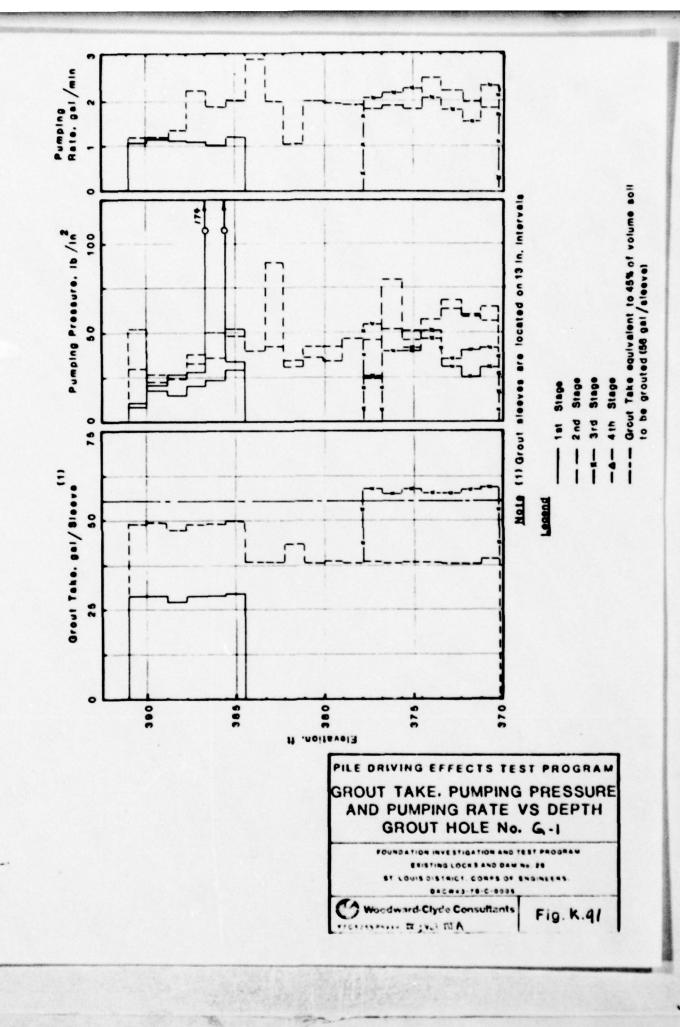


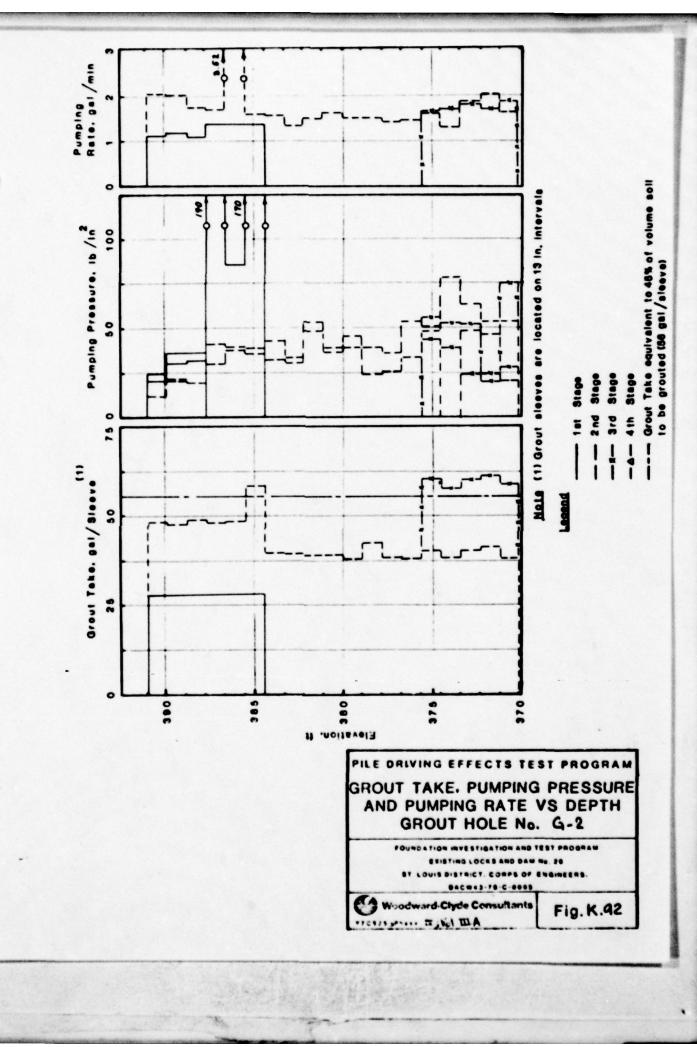


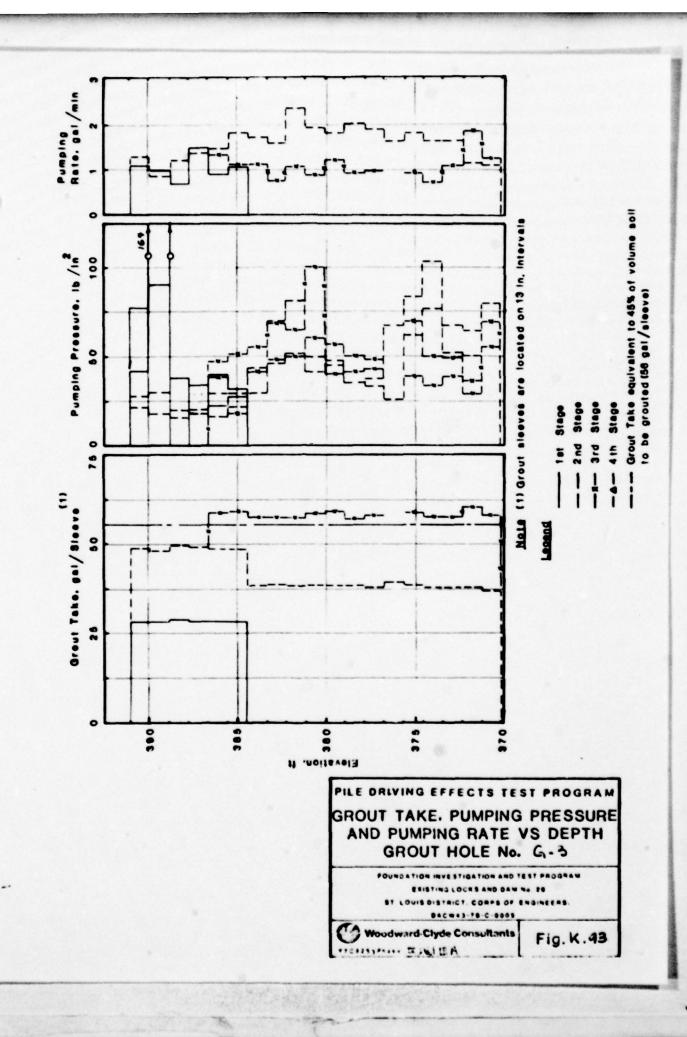


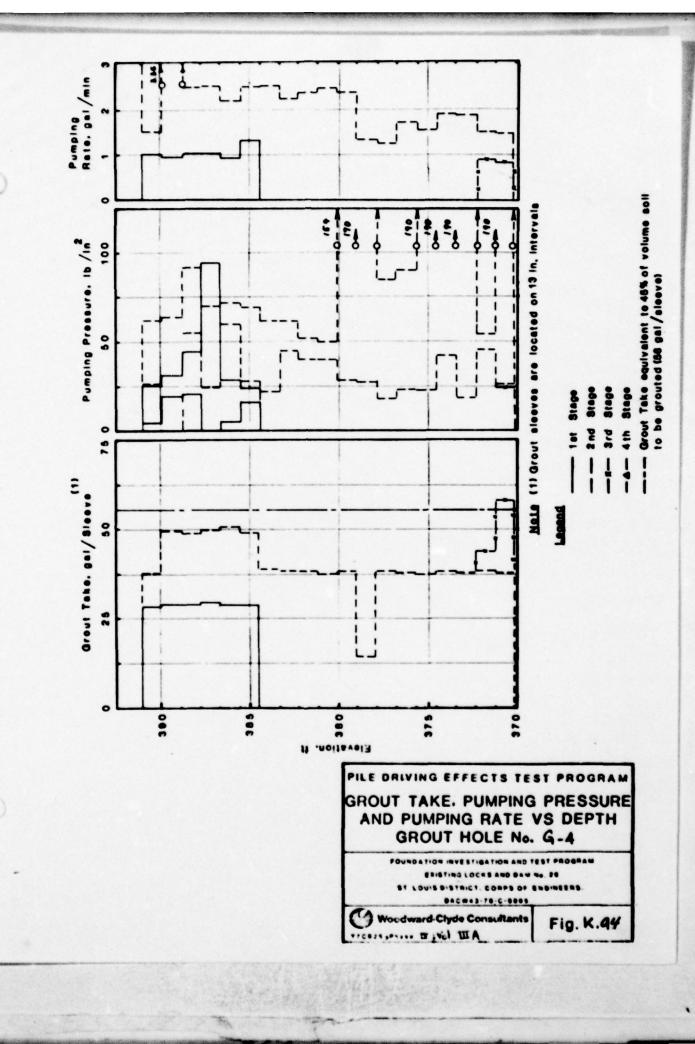


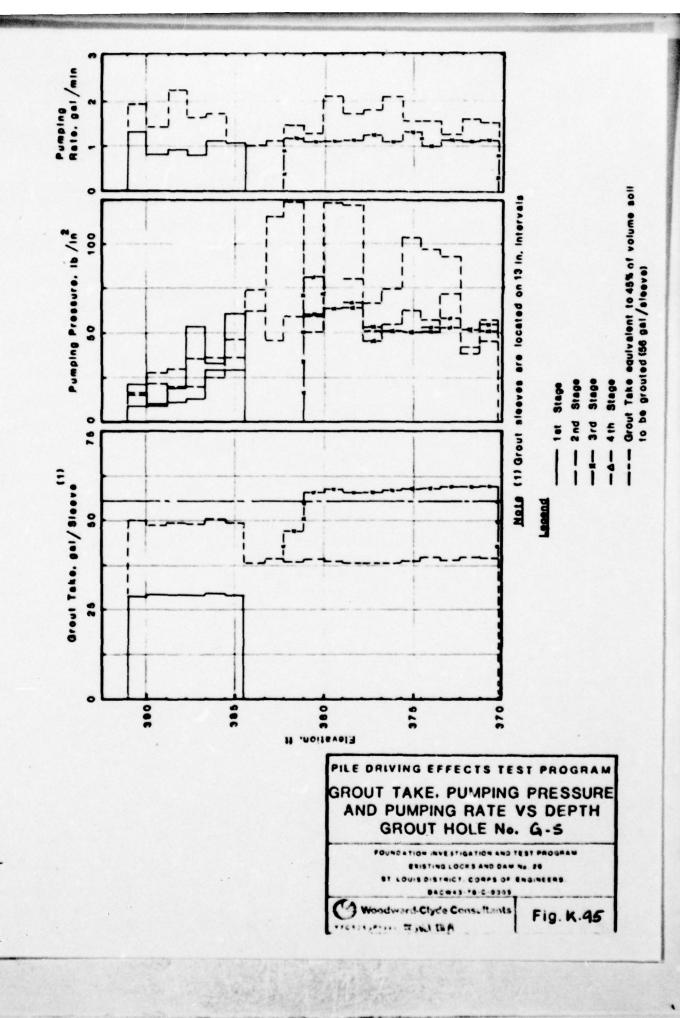


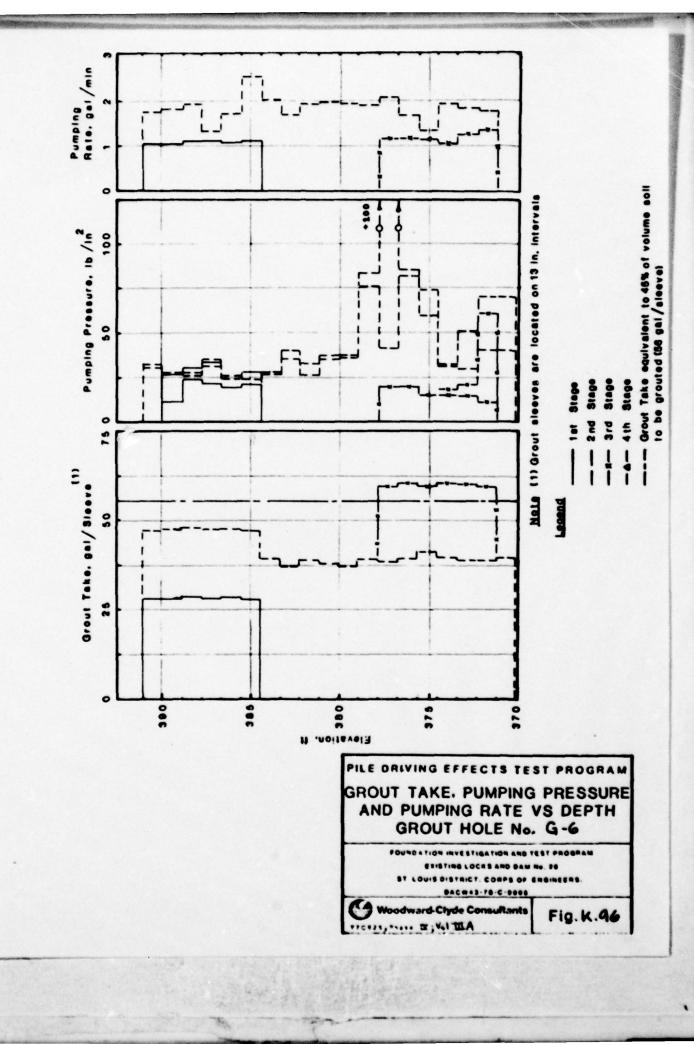


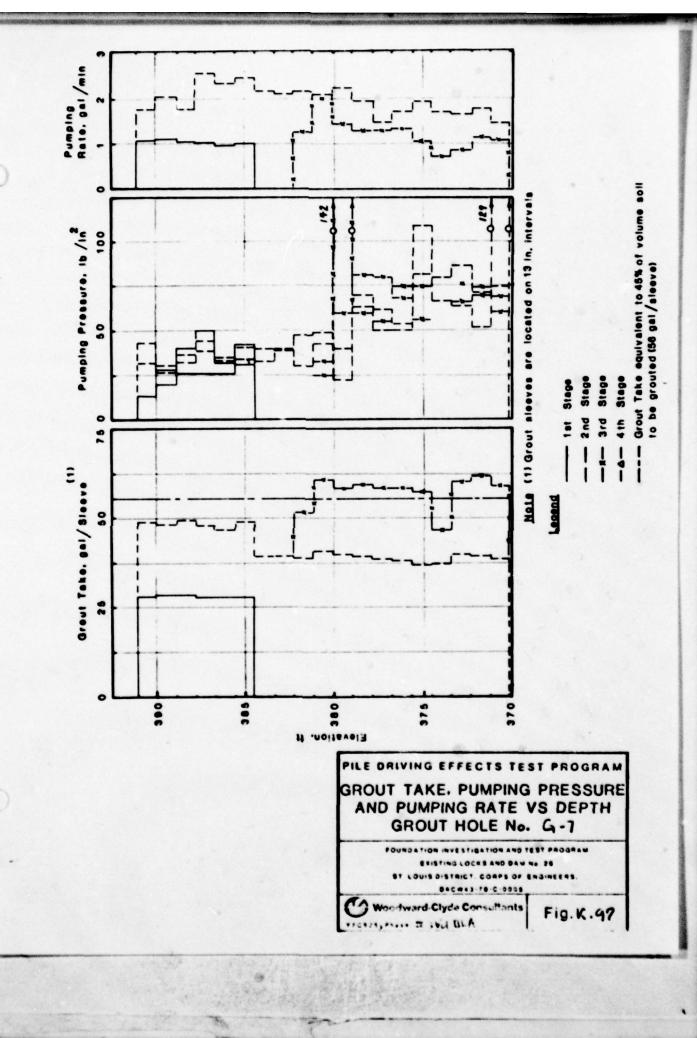


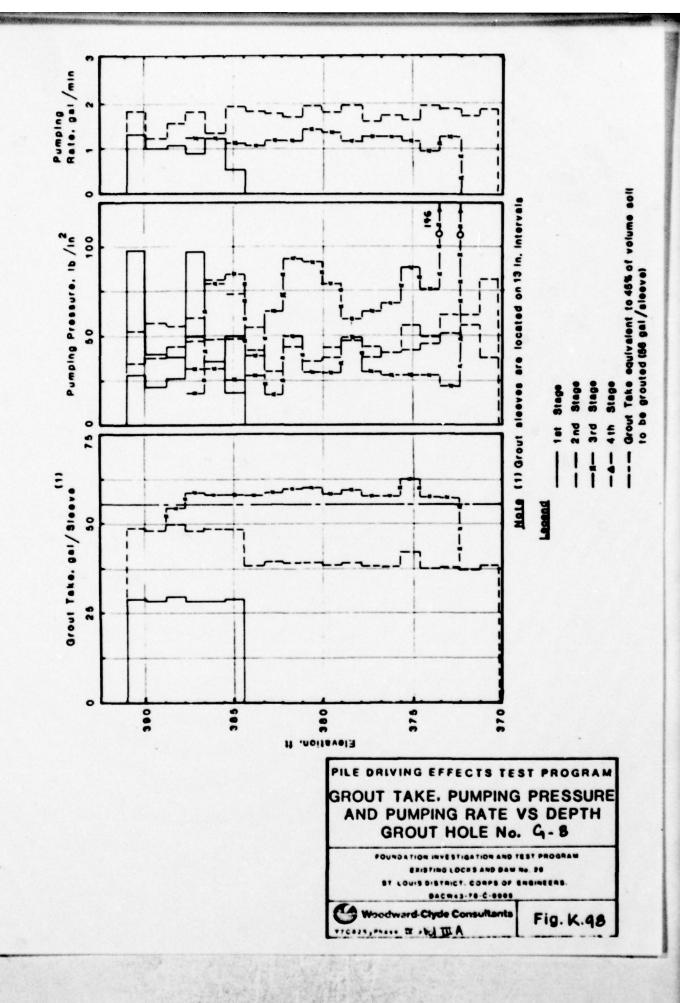


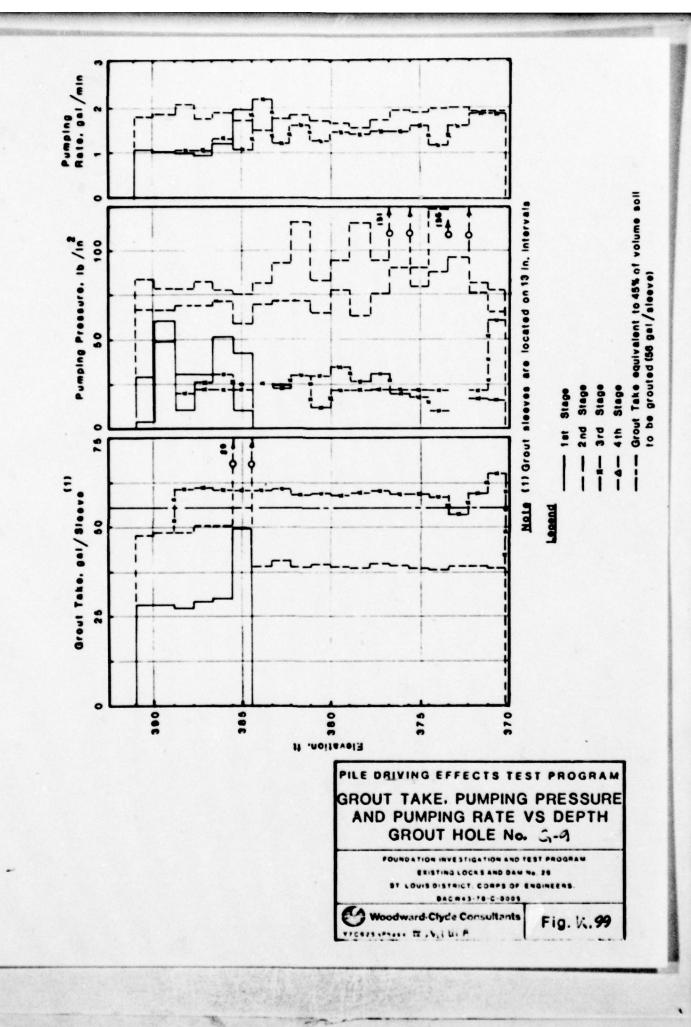


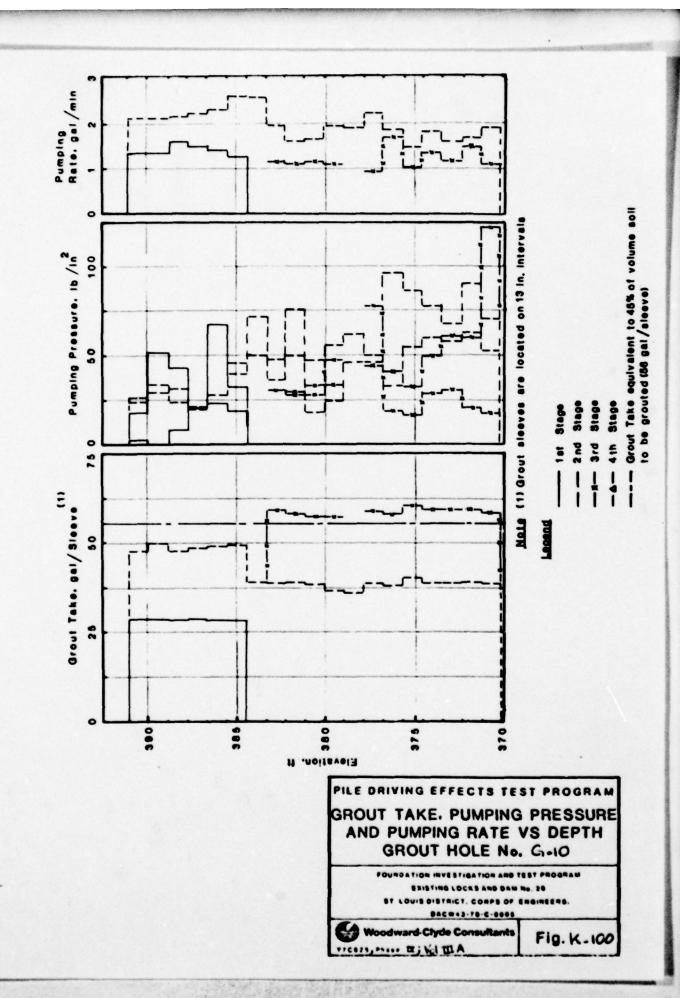


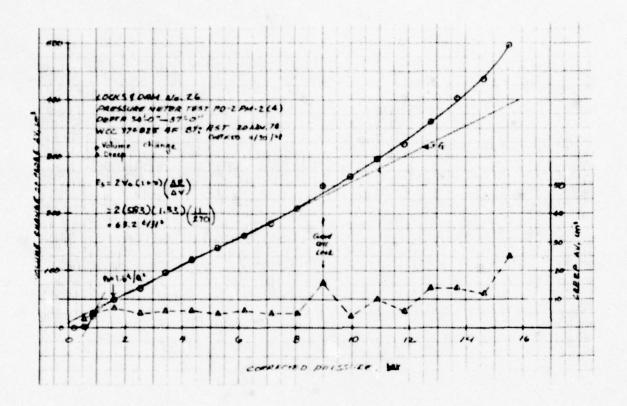


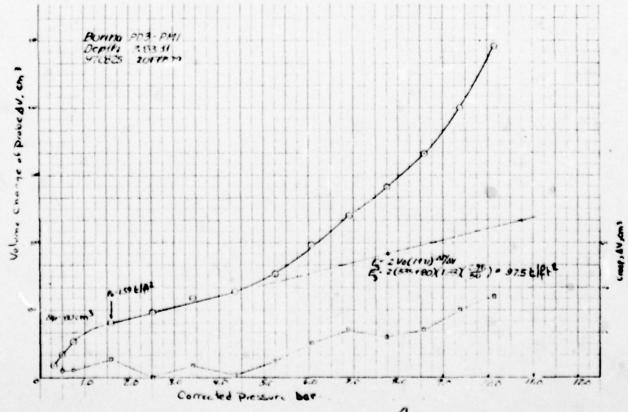


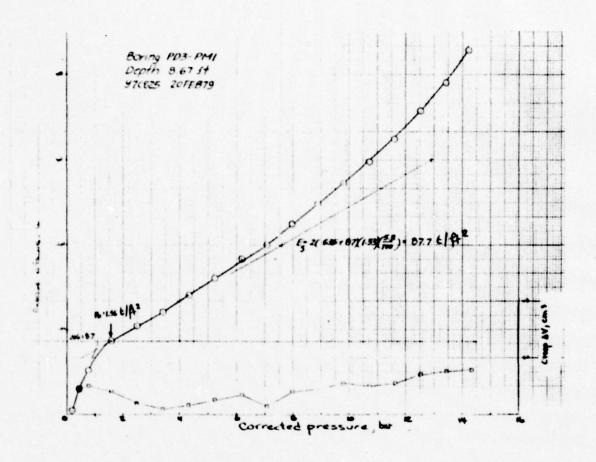












- -O-Probe volume change versus corrected pressure

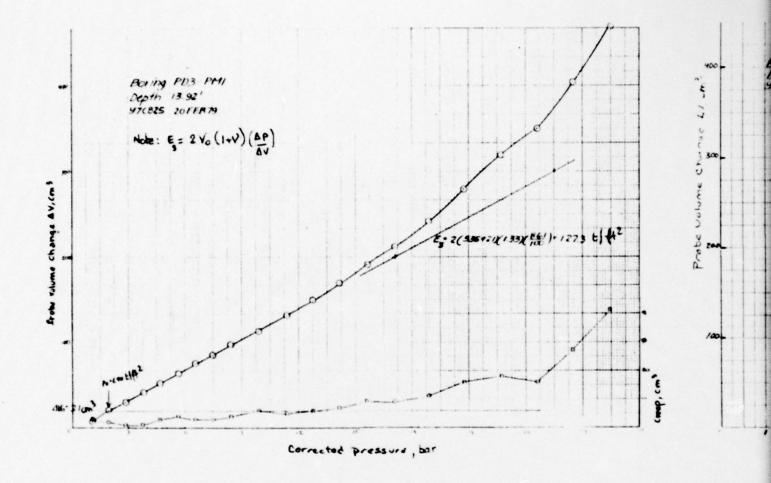
- Po In situ horizontal stress
- Es Elostic deformation modulus

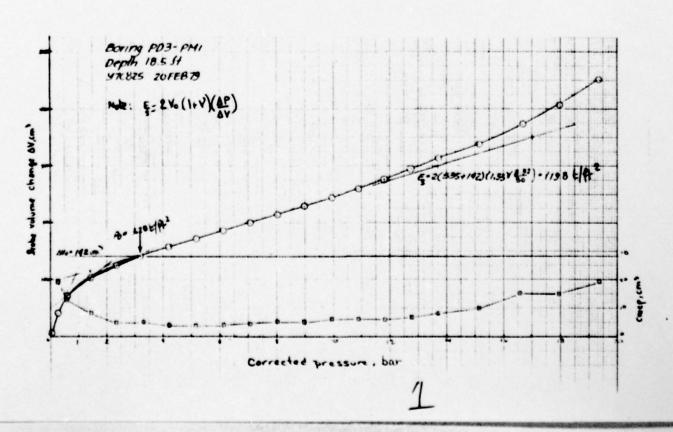


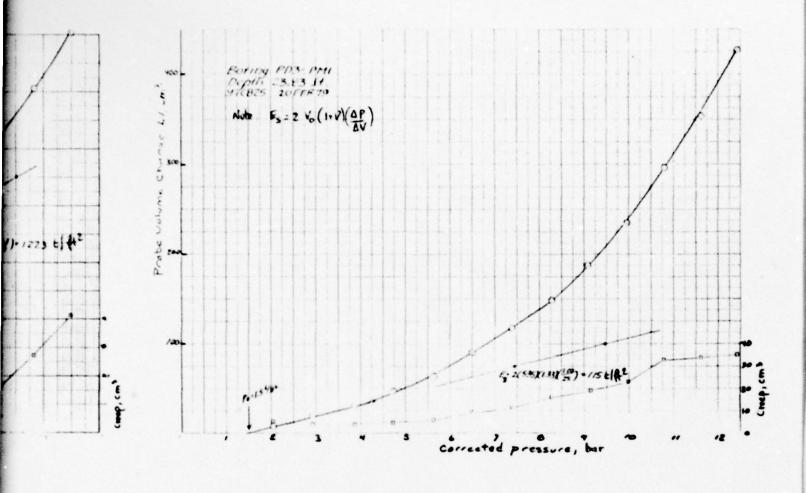
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Fig. K.101

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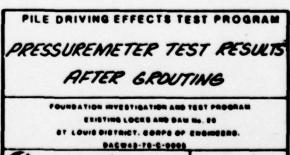






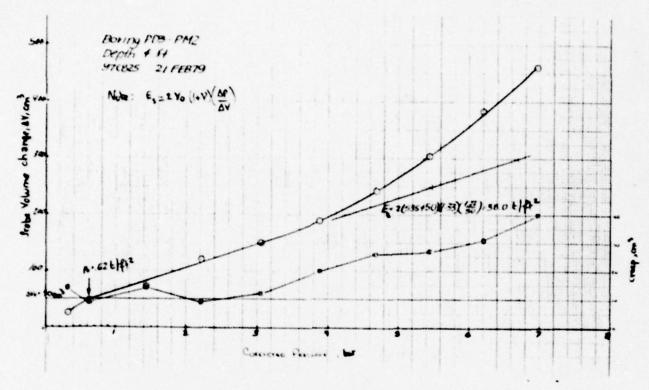
- -O-Probe volume change versus corrected pressure
- -- Creep versus corrected pressure
- Po In situ horizontal stress
- Es Elostic deformation modulus

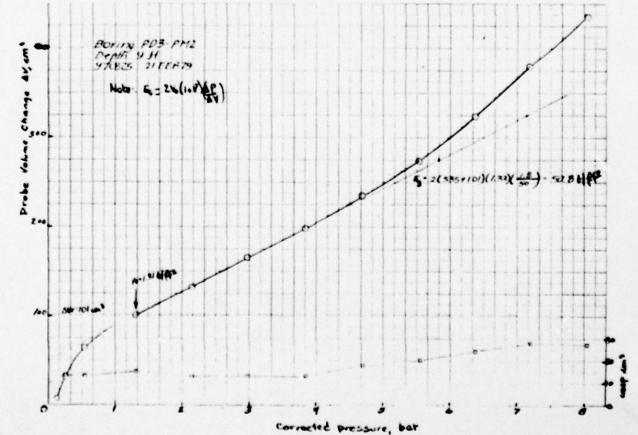
1198 EA



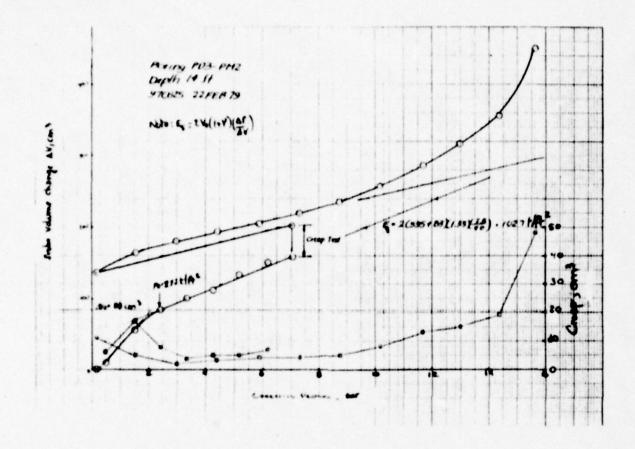
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Fig. K.102





1



- -O-Probe volume change versus corrected pressure
- -D-Creep versus corrected pressure
- Po In situ horizontal stress
- Es Elostic deformation modulus



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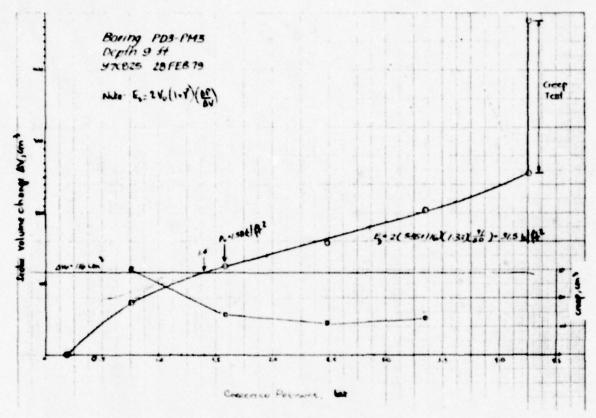
Western Title EA

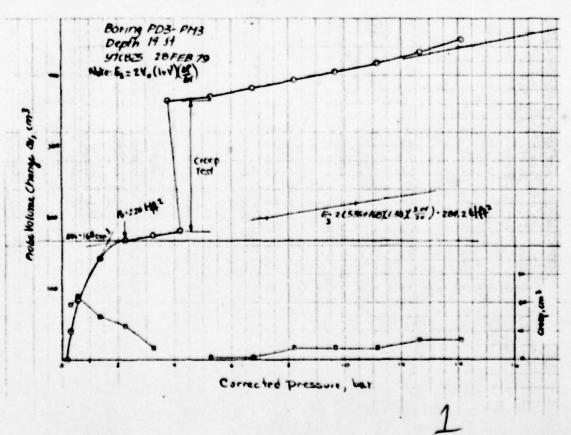
Fig. K.103

-1

B 4199

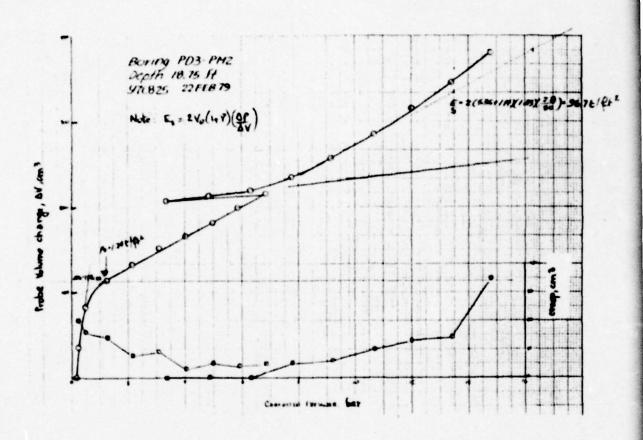
2





Legi -O-Probe vole corrected -O-Creep va pressure R In situ h Es Elostic de modulus





- -O-Probe volume change versus corrected pressure
- -O-Creep versus corrected pressure
- Po In situ horizontal stress
- Es Elastic deformation modulus

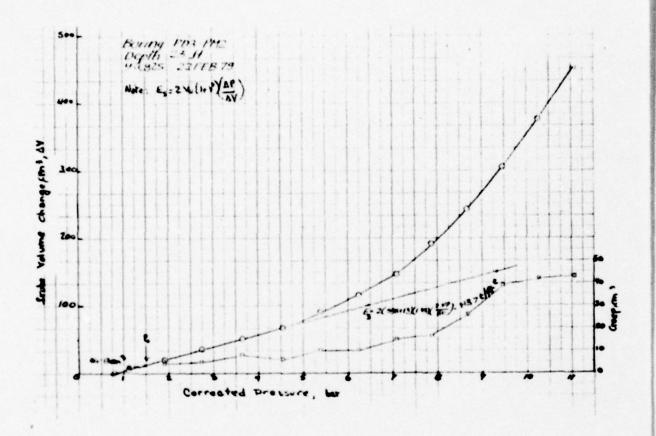


FOUND ATION INVESTIGATION AND TEST PROGRAM
EXISTING LOCAS AND DAM No. 26
67 LOUIS DISTRICT, CORPS OF ENGINEERS.

040000-70-0-0000

PRODUCTOR COMMENTS

Fig. K.104



- -O-Probe volume change versus corrected pressure
- Pressure
- R In situ horizontal stress
- Es Elostic deformation modulus

PILE DRIVING EFFECTS TEST PROGRAM

PRESSUREMETER TEST RESULTS

AFTER GROUTING

FOUNDATION INVESTIGATION AND TEST PROGRAM
EMITTING LOCKE AND DAM No. 20

ST LOUIS DISTRICT. CORPS OF ENGINEERS.
DACHES-70-C-0005

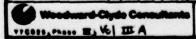


Fig. K.105

PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDIX L
MEASUREMENT DETAILS
MONOLITE M1

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L.9	Information Digitized From Analog Magnetic Tape For Monolith M1	L-120

Y7C-825 Phase Try You TA

L MEASUREMENT DETAILS, MONOLITH MI

L.I COMPLETE FIELD LOGS OF INSTALLATION OF TIMBER PILES SURROUNDING MONOLITH MI

The identification number (Id. No.) at the top right-hand corner of each data sheet includes the timber pile number shown in Fig. 5.12, Volume III

The timber pile number is given by the two digits preceeding the last two gers of the Id. No. (for example, page L-2 corresponds to timber pile No.52)

The field logs are presented in chronological order of timber pile installation

WOODWARD-GLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 03 01 160 1 5200

Pile Type Oak
Pile length 42' 120ct. 1978 Vulcaa V-/ Hammer Grand at trenchlevel opening Rate 60 Blmin Imputer - GEL Remorts String Resistance bijes Biows · Time 13:25 jetting started 11 w jet to 28' 0 14 one blow. 19 10 11 25 16 jet stopped going den Some boiling eror to pi 22 19 20 17 bring driven, landed li ele instrumentat 27 90 will lake. 21 or 8' 41/12' LESTINE 10/13/78 where we promoted no O Capacity kips Pile bener of Eco · Lestrike V Jetting depth

Wet.

2.0% € wcc, TTCBLS, Phase To

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

rom. 03 01 160 1 5300

Pile Type	Oak_	Hemmer	Vulcan V-	Date	120ct 1978
Pile length	42'	Energy	15.000	Time	16:00-16:45
Grand al.	trench total	. openting pate	60 kVm:	I as postd	Simon Kind

e pth	B10-5	Remorts	Driving Resistance bijes											
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			1111	Ш	П	П	П	П	11	II	Ш			П
		nee-lawed	1111	III	П	П	П	П	1 1	T	Ш	П		П
-		pre-jetted		m	Ħ	11	\mathbf{H}	11		11	Ш	11	TT	п
	+		+	+++	++	++-	++	++	+++	++	+++	++	₩	н
1_	-			+++	H	++-	++	++		++	+++	++	H	H
	<u> </u>		-	+++	++	++-	++	++	-	++	+++	++	₩	н
				-	++	++	+++	₩		++	+++	++	+++	н
•			-	ш	11	1	11	44		++	-11	44	ш	н
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11			1		Ш		11	_	1	11	111	11	Ш	u
16	jene			1	11			1	1	1		П	Ш	
11	1	ode wasteri ~ 6"		11	1		1		. 1	1	111	П		
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10		last circulation for ~2.	40	-	-	+	-	+	-	+-	++-	+	+++	H
10	-	pite disposed picts 19 f	4	-	-	+-	-	+	-	+-	+	+	+++	H
· Li		to 23 . Circulation retur	da .	-	-	-	-	+	-	+	11.	+	1	H
-11			-	-	-	1	-	1	-	++	111	1	++	H
			1111	1	1	1	-	11		11	111	1	111	H
11	5	jet estracted	0	_		-	11	1	1	1	-	1	111	H
25	7		0		-	1		1		1	1	1	11	L
16	9		1 0				. 1		1		11	11	11	
u	-11		1 1	P	1				11	1	11	I	1	
- 11	14		11	0	. 1			1		1	1.7	1	1 . 1	
11	الد		11		-	b		T		1		T		
3.	20			1	1	4		IT		1	11:	T	111	П
21	22				1	Ó		T		1	11	T	111	П
3,	22		11 11		1	0	1	IT	1 7 8	1	111	TT		П
11	32	<u> </u>	1	-	-	+-	1	10	111	1	111	1	1	H
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<u> </u>		L. 4. 4.1. 11 .	1	100	+	+	++	-	-	+	1	+	++	H
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-	29/6-	" Storte to get hard a	-	-	3.1	-	-	1	-	11	111	++	113	4
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			1		-	1	1	1	111	11	111	11	111	4
-			1	1	11	1		11		11	11	11	Ш	
			1 1	1	11		1		111		111	11		

Divers week		0 10 40 60 00 00
Sequente No	Depta H	O Capacity Lips
	- Pile Wates	E. O. D. Restrike
	= 6.5 % N	V Jetting Doth VH. 6.8.
wcc, 470 815	Phose # 1.0% E	10-170
	VOL TA	(:)

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PLE DRIVING RECORD

FON. 03 01 160 1 5400

Pile Type	OAK	Hammer	Vulcany-1	Date	12 oct 18
Pile length	42'	Energy	15,000	Time	1130 7 2025
Grand al.	trench level	. openting sate	60 byon	Eas postor	- Simon Kisch

C4	Blows	Remarks	Corring Resistance 61/64 -										
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t		pre-jetted loft	1 11	111	Ш	Ш	П	111		11	11	11	
		,		Ш	Ш	Ш	П		111	Ш	Ш	11	
•	1		1111	Π		III	П		111	11		II	
3	1		31 1	TIT	III	111	II	111	111	11	III	TT	
_	+		1111	111	П	TIT	11		11	T	Ш	T	
2	1-1-		110	TIT	Ш	TIT	П		11	T	Ш	IT	
•	1		1111	TIT	Ш	TIT	П	111	111	TT	П	TT	
	1-1-	Pile sinks Witting	Tili	111	Ш	111	11	111		IT	П	T	
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	Jetted			TII	111	11	1	TIT	111	11	П	11	
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··	12		-	0	++	-	+	-	+-	-	-	++	
11	13	Change shake sale & Mount		18	-+	+	+		+	+-	+++	++	
25	13		-		++	-+-	+	-	-	-	-	++	
16	14		-	100	-11	-	+	-	-	-	1	+	
u	14		-	10	-11	-	+	-	-	-	+++	+	
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	111	111	II	11	11	T	111		+ 1		1	
	111	111	П	11	1	П	11		11			2
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1111111	1111	111	11	11	11	IJ	П	1	1 5			•
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13 111			1			7	. (T			1 17	
11 : 11	1 1	- 1	1		0.1	10	. 1	1			20	1.
11 111	1111	1	L	1.1	1	D	-	1	1		19	11
11 111	1111	. 11	1	11	2	10		1	1		80	24
11111	1 1 1	11	L	11	P			1	,		1 31	u
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1-1-1-1	-	-	-		9	+	-	+	-		24	
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		K-foo								Depth H	No. 5	Sequence
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+	-	Mary Print Code		- Angele	0 p	Re		1	.)			

-5

ron. 03 01 160 1 6360

Hammer Vulcant Date 19 0+ 78

Energy 15,000 Time 1025 - 115

Operating Rate 60 kylosin Toppeter Hollows Dach Pile Type Oak
Pile length 42'1" Grand al. Trench Level Remarks Blows CA 10:25 Tile sinks let

		works.		. Fe	praity strike etting d				
		-eng NU	•				••	250	
•			1	111	111	illi	1111	111	+
-			1-1	111	111	1111	1111	111	+
			+ +	111	1111	111	1111	+++	+
	21/6.	restrike 10/4/18	1 - 11	111	1111	111	1111	114	•
,	23/1	11/15		1111		1 0	111	111	1
14	52		1 11	111	1111	1111	1:11	0	
13	47 52		1 1	11 .	111	1,11	0		
,.	44			1 . 1	111	1.11	OI	111	į.
11	3/ 3/o 38		1 1	11 1	. 1	0	- 11	111	1
	36		1	11 1	111	10	331	111	
	3/		1 1		1 '	0	- ,	11	
	23		1 1		0	1 1	1 1	111	-
12	20		1 1	1 1	1	1 11	1 . 1 1	111	4
16	22		1 1	1 : 1	0111	1.51	1111	11	1
15	2.3		1 1		d	1 . 11	111	111	1
	12		7 - 1	0	1111	1	111	1.1	1
ü	16		- 1	0	1 . 1 .	1111	11:1	11	1
L	17	1	- 1	01	11	1111	1111	111	T
Li		Creunium	1	10 1		1.11	1	111	T
10	12	movern : did not bore	1 1	0 1	111	1111	1111	1.1	T
10		and not more on the	1 1 10	1	1:11:	1111	111	1	T
18	1	Jet poe t'appe to at it		1	11	1	1	111	ī
. 7	1	Clay particles appear att			1	. 1 . 1		111	1
14	1		-		1		1	111	T
15	1			1111	1111	1 1	111	1	T
14			- 1	1111	1 1	. 11	1	1	+
-	1	•	- 133	1111	111	111	1111	111	+
"	1	Int 3 above top at 11'		1111	111	1111	1111	111	T
	1	2. 2'22 (4 11'	1	1111	1111	1111	tiil	111	i
1	+ + -		1111	1111	1111	1111	1111	+++	t
•			1111	11111	11111	iiii	1111	tit	t
2	+ + -	Jet to 18'	1111	Hiili	11111	1111	1111	111	t

WCE, TICOLS, Phase I Pile berg of the a 17% E

1 4.5.1. 10at're

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST

ron. 03 01 160 1 62:0

PILE DRIVING RECORD Pile Type Oak
Pile length 42'
Ground al. Troub level Hammer Energy Vulcau V-1 13 oct 28 Dote 1245-2 1310 15,000 Time . Openting pate 60 billionin Tospeter - Kisch Company Constraint Con Dath Remorts 64 12 45 0-1 THE ELLS 5' . Jet to 12'; jet running about 2's spoor tip of pie. 4 1111 Fix show moving at 12, jet 11 record up one and one, ple more to bounds yet Test to 14'4' .. 1111 11 14 0 15 Libras for 8" 1. . . 19 20 14 10 @ | | | 1. 24 LI 12.60 .. 24 .. 27 14 29 10 14 45 22 1.7 1 6 11 45 34 43 . 44 31 ,, 55 .. 51 30 27%. 13:10 35 restrike 10/14/71 Segrante No Dept. 14 O Capacity, Kips About · Restrice Notes . 9" 110 V Jetting depth Pile bell bolt ac WCE, TICBIS, Phase W.

0 8% E

rom. 03 01 160 1 6100

Dapth	Biows	Remarks	200	ψ'n,	ics	.+-		-	-1/5	4.		-
0-1		14:10	11:1	m	TI	TIT	Î	T	ĬΠ	T	Ш	TI
ť		Pile sints 3'	1111	1111	Ш	Π	111	II	11	11	П	II
		Tet on outside of pile, et	111	$\Pi\Pi$	111	III		11	11	11		II
•		twat pik ho, jet h 5';	1111	m	111	TII	M	11	11	11	111	IT
1		ole walked slightly.	11 1	1111	111	111	111	11	11	III	111	II
•		Je Pord wish , pile comes	1 2 7 1	111	H	111	111	1	11	Ш	Ш	II
2		back, it pipe out going change	11:1	$\Pi\Pi$	111	Ш		11	11	111	Ш	11
•		et fi S	1111	Ш	111	111	111	11	11	111	Ш	11
1		for moved to assemble; pule	1:11	1111	111	111	Ш	11	11	11	Ш	11
		more adode, at to if	1311	1111	1 1	111	11	11	11	11	Ш	11
- 11			1 1	111	11	111		1	11	111	111	11
		Clam appraise at 12'	1 1	1111	11	11.	111	11	11	111	11	11
		3	1 1	1111	11	111	_	11	1	11	11	11
14		The state of the s	7.1	1111	1	111	1	1		1 + 1	1	11
15		Jet to 12'6"	- 1	111.	11	111	1	1	+ 1	1	1	11
11		1		1_	11	111	1	-	-	1	11	11
				1	4	-	1	1		11	11	11
14		blows for 6"		10	11	-	-	4	_	1	11	#
19	9			· Andrews	1	11	1	: 1	11	11		++
10	15	1	1	110	-	111	-	Ц.	11	1	11	11
u	14	Monagathered for Bound 1266	-	6	11	1	11:	11	1	11	4 5	11
-11	11	there is staged for Dail at all	1		•	1	1	1	-1	1	-	+
	17		1	A Commacron 2		*	1	-	1	-	-	11
24	17	14:45		COMMUNICATION .	2	1	-	-	++	-		+
	16		-	1 6		111	+	+	-	H	-	++
- 16	1.		1	Annual Control	minute and	-	-	-	-	11	11	-
1/	16		-			+	-	-	-	-	11	+
	88			-	16	. 6	1	-	-			-1-
	24		-	-	1			-	-	1	11	-
3.	29		1	-	+	-	10		-	11	1	11
31	34			1	1	1 -1	110		-	11	H	1
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	31/9.	restrice 10/14/71	1.11	11	11	11	11	11		111	11	TT
		The strice in the strict	1 11	1	1 1	111	1	11	T	TI	TT	11
- Transport	-		1 1	1	117	111	11	TT	TT	111	111	TT
			1 1	11	11	11	111	11	11	111	III	TT
			1 1	111	11.	11	TIT	11	TT	111	11	11
		-ents No		To	100	-	30	2	-0	Z		-
Segrence		Spirit		00	-0-		k.	-				
		- Nates				toke						
		Tip 16		D.	7.4	ting	4	-	h			

TON. 03 01 160 1 64.0

Pile Type Oak
Pile length 412' 13 Oct 1978 Vulcan VI Dote Hemmer 20.45 Energy. 15000 \$11. Time Imputer - Gary Links , opening Rate 60 blessfer Grand al treat lead Chrising Resistance Remorts 61/64 -40:45 0-1 fire getted to B' . Ble fre la C' Pile getted to 14 11 13 14 14 11 10 14 14 15 0000 55 blan /min 16 14 11 .. 25 26 1. 0 17 17 11 30 55 blowing ma .. 20 24 21 5-5" 25/6 1) 34 drag to \$4 5 by 2140 Segranu No Depth to Di (PDA) Se 18/2 O Capacity, Kips Motes: · Legnite V Jetting depth 2.9% N 1 Het 3.4% E WCC, YTCOLS, Phose W

WOODWARD-GLYDE CONSULTANTS LOCKS AND DAM MO. 30 PRE DRIVING EFFECTS TEST

B10-3	Remarks	. 5	27.	ES-1	**		4	.1/6	111		3
-	21110		++++	+++	##	++	Н	#	₩	#	Н
	Fre- setted to 16"			Ш	Ш			П	Ш	Π	Ш
	Pik ton to 6'	1111	ЩЦ	Щ	Щ	Щ.	Ш	4	Щ	11	Щ
				₩	#	++	1	++	##	#	Ш
		1111	++++	†††	##	+	1	Ħ	##	11	Ш
		1111		Ш	Ш	Ш			Ш	\coprod	Ш
	Pule settod to 12'4"	1111	Ш	Щ	Щ	Щ	Ш	Щ	Щ	4	Щ
	9	1111		+++	++	+	Н	#	##	++	Н
		1111	1111	+++	++	++	+	+	##	#	Н
36.6		•					П			П	Ш
3		0	111	\Box		-			11		H
Control of the last of the las		-	1111	++	++	-	+	1	++	++	#
-				++	+	++	+	-	111	++	Ш
1		0	111	П	11		Ш	11	Ш	П	Щ
•		0	1111	11	4	1	1	1	111	++	₩
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-	6 + No. 2 / 2 / 2	1 - 1	THE OWNER WHEN	+		1			11		111
11		1 1	9		1				11		Ш
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		-	or manufactured the same	++	++	+	Н	++	11	11	H
THE RESERVE AND PERSONS ASSESSED.	55 blass /no		0	\mathbf{I}	П			11	11	11	\equiv
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11/4	10/14/22	+	***	++	+	-		1	1	#	#
	14444				Ш			Ш	Π	П	Ш
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	- Nes		Contract Contract	AND DESCRIPTION OF	-	-		-	2	-	
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1	File baffer at E		△ 2 • 5				•				
	7	Pulc jettod to 12'4" 26'4" 26'4" 2	Pro- jetted to 16' Pile can to 6' Pile jethod to 12'6' Pile jethod to 12'6' 2	Principle to 16' Principle to 16' Principle to 12'4' Principle yellow to	Pro- jetted to 16' Pile yetted to 12'4' Pile yetted to 12'4' 2	Principal to 16' Pile con to 6' Pile gettod to 12'6' 2	Principles to 16 Principles t	Principles to 16 Principles t	Principle to 16 Principle of 12'6 Principle of 12	Principle to 16' Principle of 12'4' Principl	File julied to 12'4" Pile julied to 12'4" Pile julied to 12'4" Pile julied to 12'4" Pile julied to 12'4"

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PRE DRIVING EFFECTS TEST TON. 03 01 160 1 5600 PLE DRIVING RECORD Pile Tipe Oak
Pile length 1/19 Vulcan V-1 13 Oct 28 Date Hammer Energy 15,000 2315 - 2400 Time . Openting Rate 60 blown Formate- Aggaratel . Grand al. treach level Remorts B10-3 23:15 --Pile sinks 10%. Clay lemen seen in 7 Jetted to B'6" blows for 6" 12 0 14 15 10 14 10 . . 10 11 19 13 10 H M 16 11 11 20 14 11 16 .. 16 12 lie 28 16 11 32 3. 21 23:45 . . 15 34 SI blows for 6. 24 00 35 23 26/0" restrict 10/14/78 Service No Deporte O Capecity Kips 1. 0.47. N co.a · Redrike V Setting Depth Just

WCC, TYCOIS, Phase IT A

-12% N-

TON. 03 01 160 1 5700-

Pile Type Oak Hammer Wales V-1 Date 14 Oct 28

Pile length 42' Energy 15,000 Time 0000 - 0000

Grand al. Joseph Keel Operating Rate 60 kV min Engelight

Copth :	Blows	Remarks	08:	n.	Re.	3.1	+-	-	-	rile	٠.		-	1
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		File sinks 17'		+++	+	+	++-	++:	++	! : :	₩	H	+	н
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-	21/4.	restrike 19/14/78	1111	-	UNITED I	-	1.	1	11	tit	1	+	+	H
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-	פייים מו	D Capecity, Kip
	Notes Total	Rostrike V Jetting dept
WCE, 175 815	3.14 €-	

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST TON. 03 01 160 1 6900 PLE DRIVING RECORD Pile Type Oak
Pile length 42'
Grand el. Tooch for Vulcan VI Date 14 at 1930 therat 15000 St lbs Time 02:15 Empeter - D. Aggarul Dorth Remorts 10/14 CA 2115 --Pre inted to 15' 11 9 10 14 14 11 13 . 13 11 12 13 .. 22 22 23 30 32 20 24 11 34 16/1 restrike 10/14/18

September 10 Depth 41

File Notes: 1 East Petting depth

7.1% N

7.1%

Med

WCE, TTC BIS, Phase II Yol II A

*

Ton. 03 01 160 1 6000

Depth .	Blows	Remarks	op.	7:-	2.8	es.	.+-	~ **	-1	-1/5			*	j
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	-	Pile sinks 2'6"	1111	H	##	##	###	+++	H	111	++	H	H	
	-		111	H	+++	++	111	11 †	÷t	ĦĦ	ti-	H	H	i
		Jet pile tob' pile	-	₩	₩	++	+++	+++	₩	###	++-	#	+++	-
		Is walling E		++	+++	++	111	+++	+	+	++	H	H	i
÷		m	1111	tt	111	ti	tti	111	TT	1	11	H	H	i
		Move jet to Wade;	111	ti	111	1	111	111	11	III	11	П	Ш	1
•	<u> </u>	Clay balls at 8'	111	Ħ	111	T	111	TIT	T	111	11	П	П	1
		wood buts at 10'	1111	T	111	T	111	111	11	III	П	П	П	1
11			1 - 1	1	111	I	111	11		11	П			
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14		the walking had & proper.	4	L	11	L	1 2 9		11	1		-	Ш	1
13	1	prison 10:48		L	1 - 1	1	111	1	1	1	1:	1	Щ	4
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1	31			no dicesso	-	-	-	6	++	-	-	+	+++	4
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11	37	29 6 /30 ALL	111		7.1	1	111	6	+	T	1		1	1
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16	L					T	11	10	-1	1 1	11	1		1
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-			1	+	1.1	T	III	111	11	111	11	1	H	1
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			1	1	111	T	11	111	11	ITT	11	T	П	1
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Segrona	No E	2014) C	-		1. K.	-					
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FDN. 03 01 160 1 5100

Pite Type Dat Hammer Vulcas V-1 Date 14 Oct. 1978

Pite langth 42.1' Energy 15000 Time 13:13-13:45

Grand al. trench bod opening sate 60 bl/sin Esspecial-Scall Ball

epth .	Blows	Remorks	0 8"		20	3.	*	-	**	-	-1	64	_		-	1
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14		move jet to se side		11	11		1		11	1 1	1	11			"	
		jetted to 17 ft fel jet		11	II			П	П	1	П	11			11	
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11	*	13:24		-	+	-	-	+	1 1	-	+	-	-	-	+	4
-14	6	13:27	0	1	1	1	1	4		1	1	1	-		щ	Ц
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	- 17		-	-	4	-	1	+	++	++	#	+1	+	+	+	Н
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CC, 77	COLS . Pr	0 2% N											-	-1	40	
	V	LEA "														
	10															

TON. 03 01 160 1 5900

Pile Type Oak Hammer Vulcan VI Date 14 Oct 78.

Pile langth 42.2' Energy 15.000 Time 1432 - 1537

Grand al. french level . Operating Rate 60 billion I saporter - Hundricher

Ci Ci	Blows	Remorts	: 5.1	··· ka	20	*	•		1/6	٠.		*	-
0-1		1432	1111	Ш	Π	Ш	Ш		II	П	Π	I	
ť	1	Pile sinks 3'	1111	Ш	111	Ш		11	11	Ш	Ш	П	
	TI		1111	$\Pi\Pi$	111	Π	Π	11	11	П	Ш	П	
•	1 4	Drive to Y'	1611	Ш	III	III	III	1	11	П	П	П	
•	1	Jet to R'; pile unlking	11	1111	111	111	111	111	11	11	111	11	
-	1	TOS" to SW	11:1	1111	TIT	111	111	1	11	П	TI	T	
3	1 1	Clay both at 2'	11:1	IIII	TIT	TIT	T	11	11	П	П	T	
•		1	1111	IIII	111	Ш	11	11	11	П	П	П	1
- 3	1	Jet pipe on SE side	1:11	1111	111	111	III	11	11	IT	П	11	
	1	Jet ale to 16'5"	1111	1111	111	111	11	11	TT	П	П	T	
- 11	1	1	1	TIT	111	111	11	T	11	II	П	TI	
		Wood hits at B'	1111	1111	111	11	1 1	11	11	IT	11	T	
	1	A ALM	,	111	T	11	1	11	TT	111		11	1
14	1		4.3	111	T	1	-	11	T	1.		11	1
13	1 1			111	1	111	1	- 1	1	1		T	1
10	1 4	blows for 6" H:45		-	1	1	-	T		1	11	11	1
. 7	7	Tauns br a Hiss	6	1	11	1	- 1	T	-	11	11	T	1
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33	36	15.87	1	11	1	1	PROPERTY.	0	11	1	Πİ	T	1
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Segroup No Depth H Notes of F.a.s. Pile bater at F.a.s. 0.7% S

© Capuaity, kips

■ Restrike

▼ Jetting depth

vest.

WEE, THE BIS, Phase IT (-6% N

TON. 08401 160 1 5000

Pile Type Del Hemmer Vulcon X-1 Date 14 Oct. 1978

Pile length 12.1' Energy 15000 A-16 Time 17:50-18:25

Grand al. trent level operating Rate 60 kl/min Empatie-Descrit Syornol

Depth	Blows	Remarks	o Restrict to so 40 so
0-1		17:30	
•	1		
Contraction of the Contraction o	+ + -		
	+	Salad to 187	
<u> </u>	+	a pre-jested to 15'	
	+	a pile nins in to 11'	
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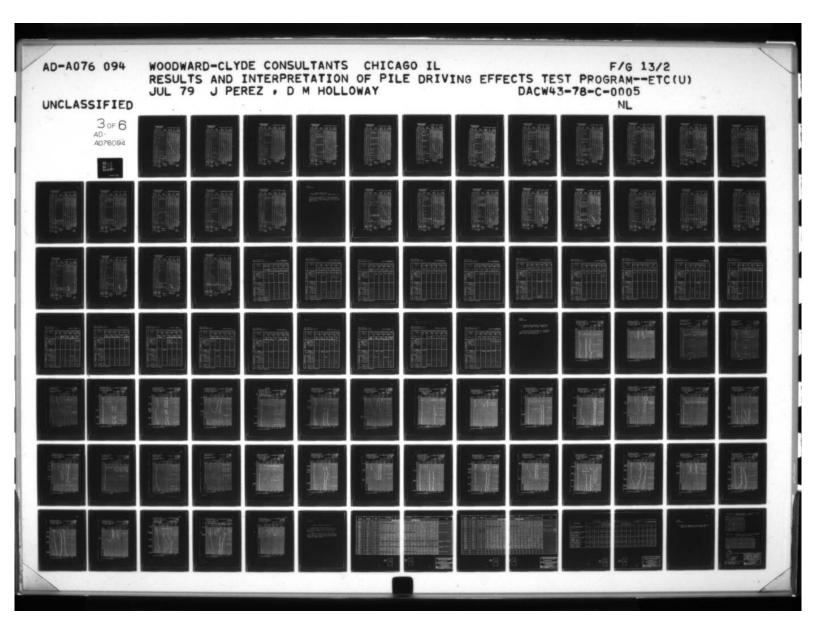
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		Pile better at E		. 1	-						

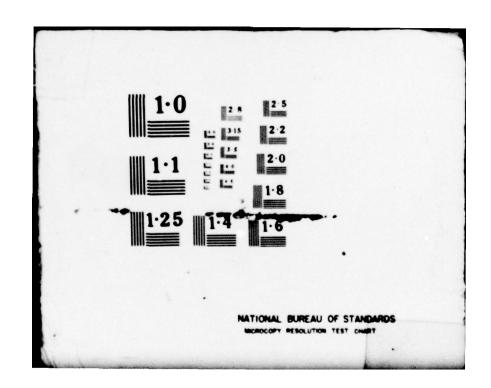
FON. 03 01 160 1 6700

Pile Type Fir Pile length -43' Grand al. Trach Les Vulcan VI Hammer Date 16 at 1978 Energy 15000 St lbs Time 21:45 Espector - D. Ragical

epth :	Blows	Remarks	British Kes	tonce b	1104
0-1	1	21:45		THE THE	minn
t					
1		Pre- setted to 15'			
-	+	Pole ten te 11'6"		****	
	1	1			
-	+	Drans o Her (gove)			
•	1	Isian per d'honte)			
		in wash , 13' + 15'			
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11	1 1				
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14			2 (2) 1 (1) 2		
15		Pile jetted to 17'	11.1 111 7		
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	-	= 2.6 % N			18.1.2
		Mase W 1.2%	MARKET C 800	The second second	10at'70

VOL II A





Pile Type	DAR	Hammer	Vulcan VI	Date	16 Oct 1978
Ale length		Energy	15000 St 165	Time	23.26
Grand al.	Treach here!	· observed by	60 blow/00	Eas bring	D. Agaircial

Ci Ci	Blows	Remorts	o Dr	370	25		10	*	40	64		*
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15	32		+	1	+	+++	10	+	++	-	++	++
N.	53	61 bless / min	+	1	++	+++	16	++	+	++	-	+
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	= =	2.5% A	,	Δ2	ett	יייק	-	1		11	110	1

FOM- 03 01 160 1 7000

Pile Type Oak	Hammer	Yulcan VI	Date	17 Oct 1978
Pile length 42'	Energy	15000 St lbs	Time	02 00
Grand all Treach Lovel	. Openting Rate	60 planifer	E es penté	- D. Aggire

C4	Blows	Pemarks	C Driving Resistance bijes
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-	1	1	
4			
•		Pre- which to 20'	- 14325 (242) (222) 1221 (271) (271) (271)
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30	60		11-111-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1
33	52	2:35	
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		1	
1	No. 1	ments des bestite File better d	Capacity, Kips Rednike
		_ 2 3%	N Dathing depth 1851
	-	Nase # 3.9%	INCI

Region to 15' Region to 8'6" Plus can to 8'6" Subseted outs out and to	p1h	Blows	Remarks	C Driving		+= - = =	61/64	-	*
# Region to 15' 9 Pile two to 8'6" 5 Pulled gile out and 9 Started course due to 10 Personal spament 11 Pre-grand to 20' see 12	54				· Kie	10	40	50	
Regres to 15' Ple cun to 8'6" Pulled file out and timetal outer due to gene aliquement President due to 20'500 II II II II II II II II II			No.		Щ		11111	\mathbf{H}	Ц.
Pick of the set and Pulled file out and Started owns due to Common measurements No Pick of the set of the	-			1111111	+++++	####	11111	##	11
S Pulled sile out and 2 stacted owner due to 2 space alignment 11 15 16 17 18 18 19 19 10 10 10 11 11 12 13 14 15 15 16 17 17 17 18 18 19 19 10 10 10 10 10 10 10 10	-		Ate- which to 15'	 	++++	44444	++++	##	Н
	•		P.k run to 8'6"	11111111	HHH	HHHH	+++++	+++	Щ
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			- Pik bater of		T. 4	. dest		N.C.	

TON. 03 01 160 1 72 0

Pile Type	Och	Hammer	Vulcan VI		Bat 1938
Ale length		Enrgy	15000 Stlbs	Time	00:10
Grand al. T	nach beel	corsy pate	Go Hous on	E es pento	D. Aggarwel

co .	Blows	Remorts	o Drie		Res		-	•	•	-	164		,	1
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-	_			+++	#	11	H	T	111	+	11	1		Ħ
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17	12			0	#	+		-	ш	+-	+	1	П	Ħ
14	14			0	11	+	1	-	-	+	T			1
19	12	wited with set supe on South	11	•	Ħ	1			111	1	7			T
10	12	Sute of pile. El pipe to 29'		6	11	1	П		111	T	T			T
N	13	San Shire San	77.7	0	11	+			71	1	11	1		710
11	16			0	Ħ	+		+	111	+	11			₩Ÿ
ü	13		-	-	at	+		+	111	1	Ħ	1		11
11	20		1111		14	+	11	1		Ħ	11	1		Ħ
23	15		1 1		T	10	I	T	11	T	11	1		П
.16	31				11	T	П	7	. 11	11	T	1		11
12	37			111	11	#			6	11	11			11
24	40			111	11	П		T		4	11	П		Π.
.,	37			11	11	1	-	-	6	T	H	+		113
20	50	Je Hed. wt me & 30 11. 10 3	9		11	-		T		Т	П			4V
24	27				Ħ	1	0	T	5	T	7	1		
31	35		Late	II	П	T	T		0	1	П		25	П
11	42				П	1			111	To	П	П	16	П
31	55				П					П	П	П	To	П
11	62	0:03			П			88	Ш	П	П	П	80	To.
	52/10	restrike 10/21/72		111	П		1	88		Π	П	П		115.
					П	1	1	1	Ш	П	П	Ш		1
- 4					Π	П			Ш	П	П			
			111		П	Ш			Ш	П	П			П
			111		П				Ш	П	П			I
à (t		month yes Roth to yes Mother: at 1	E.O. Q		Re	de	. 4		+			25	•	
	_ :	27%5		A	3.	H	3	*	4	-		#.		1

VI TA

Pile Tipe _	Oak	Hammer	Vulcan VI		1801 M78
Ale langth _		. Operating Bate	15000 St 165	Time	07:45-1:45
Grand al. Tree	xh huel	. operating pate	60 Houston	E as bory	- D.T. TSO

es .	Blows	Remorts	5				2	25	**	-	^•			-	10	4		-		1
	-	7.00	11	T	'n	T	П	fr	П	Ť	ñ	T	ri	ň	Т	п	ň	T	П	1
	-	Pre- u Ha) to 2084.	++	Ħ	Ħ	+	H	tt	Ħ	+	H	+	H	t	H	Ħ	H	+	H	1
	-	Ble You to 70t	++	Ħ	Ħ	٠	Н	Ħ	н	+	Н	+	H	۲	н	Ħ	н	+	H	1
	-	13k fun to tit	+++	1	H	٠	Н	H	н	+	Н	+	Н	t	H	Ħ	н	+	н	1
1	-		++	-	H	+	Н	H	н	+	Н	+	н	н	Н	H	н	+	н	4
	-		-	-	H	+	н	₩	Н	+	Н	+	Н	н	+	H	н	+	Н	4
_	-		++	-	Н	+	Н	H	Н	+	Н	+	+	٠		H	Н	+	H	1
			++	+	H	+	Н	H	Н	+	Н	+	Н	Н	+	H	Н	+	H	1
-	-		++	++	Н	+	н	H	Н	+	Н	+	Н	н	+	H	н	+	Н	1
-1	-	P.b 17'6", col	++	+	H	+	Н	++	Н	+	Н	+	Н	н	+	H	н	+	Н	ł
	-	yet an south - cast side.	-	+	Н	+	Н	H	Н	+	÷	+	Н	н	+	H	н	+	Н	ł
	-		++	+	Н	+	н	+	Н	4	Н	+	+	н	+	H	н	+	Н	4
-11			+	+	H	+	Н	H	Н	+	Н	÷	+	H	+	H	н	+	Н	1
-11	-		\vdash	4	H	+	Н	н	Н	1	H	-	H	۲	4	۲	н	+	Н	4
11	-		-	+	H	٠	Н	+	Н	+	Н	+	Н	٠	+	++	H	+	H	1
13	-		-	+	H	+	+	-	н	+	Н	+	Н	۲	+	++	н	+	Н	4
-11	-		11	+	÷	-	+	₽	Н	+	Н	+	Н	╀	+	H	н	+	Н	Ł
-11	-	6 151 2 2 1	-	+	H	+	Н	╌	Н	+	+	+	Н	٠	÷	H	н	+	Н	ť
-14		Pile setted to 18' with set on porth post sude	-	+	H	-	+	+	Н	+	Н	+	H	٠	+	+	Н	+	Н	1
19	R	Dette out side	++	-	5	+	+	-	Н	+	+	÷	Н	٠	+	Ħ	н	+	H	4
10	_11		-	+	۴	-	+	+-	۲	+	Н	-	Н	٠	+	H	н	+	Н	4
-11	16		-	+	1	_	4	+	╀	-	Н	+	Н	٠	+	н	н	+	Н	1
	13_		-	+	-	-	4	+	+	-	Н	-	Н	╁	+	+	н	+	Н	1
	18		-	+	Н	÷	÷	+-	٠	+	Н	-	H	Н	+	H	н	+	н	1
	73	ECUL T	-	+	+	-	4	1	+	+	H	÷	+	Н	+	H	۲	+	H	1
-15	22	55 Nous/no	-	+	H	-	+	łż	+	Ť	Н	-	H	H	+	+	н	+	H	1
-16	92		+	+	÷	+	+	12	1	+	Н	-	Н	٠	+	H	н	+	Н	1
·	26	36 blevs/on	+	+	÷	+		H	6	4	Н	-	Н	Н	+	H	Н	+	Н	1
-11	25		+	+	-	+	7	+	-	+	Н	-	Н	Н	+	11	н	+	Н	4
	23	6.11	+-	+	-	۰	+	۴		5	Н	+	Н	۰	+	++	H	+	Н	1
30	32	56 blows for	+	+	٠	٠	+	+	+	Ť	Н	+	+	٠	۰	H	H	+	H	1
-24	39	58 blew /c	+	+	H	1	+	1	1	+	Ħ	+	-	1	-	11	Ħ	+	Ħ	1
1:	43	SE SIGNATOR	17	+	H	+	+	++	+	+	H	+	1	7	7	11	Ħ	+	H	1
-11	45		+-	+	H	+	+	+	+	+	H	+	+	+	-	+	H	+	H	1
-11	55	60 11-1/- 1:05	+	++	H	+	1	1	+	+	H	+	H	H	Ť	11	H	1	H	1
-11	- 25	50 bless for 1:25	+-	+	H	+	+	+	+	+	H	+	+	H	+	Ħ	H	۲	H	1
			+	1	-	+	+	+	+	T	1	+	H	H	+	++	H	+	H	1
-		 	1	+	-	+	+	1	1	T	H	+	+	H	+	Ħ	H	t	H	1
			1	+	-	+	+	+	H	1	H	+	1	H	+	11	Ħ	+	H	1
-			+	-	-	+	+	+	H	-	н	+	+	н	+	++	H	+	+	4

					1111
Segrance No.	A channe	•			. 20
		ile Motes; at		• Restrice	
	= '	04%	S	V Jetting da	, a
WCE, 175 815	Phone III	7.7%	E		
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	VOL TIA				

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST

Vel 164

Thu 03 01 160 1 7700

Depth .	Blows	Remorts	1:8	::7	::2.	Re	3.1				Lije	M.		-	1
0-1		1:59	100	ľ	Ш	П	Ī	I	Ш	IÌ	Ш	П	ĬI	П	d
•		Tile sinks 4'	PI	1	Ш	Ш	Ш	Ш	Ш	Щ	Ш	П	П	П	
			1111		111	4	Ш	4	Ш	4	111	#	#	ш	Ц
•	1		1111	1	Ш	Щ	Ш	11	Щ	4	Ш	4	11	Ш	Į
	1		11	1	111	#		11	Щ	11	11!	#	₩	ш	μ
	-	Jet to 126" mills jet on SE ande	+++	2		H	+	#	H	+	##	₩	₩	Н	H
	-	DALSE AND	111	1	+;;	Н	+	##	H÷	#	H	₩	₩	н	H
•	-		11	1	+++	Н	+	₩	H÷	#	+++	#	ti	Н	Н
_•	+		+++	÷	***	H	+	++	++	++	H	Ħ	H	н	Н
	+-+-		+		111	Ħ	i	T;	11	Ħ	111	#	Ħ	H	i
-11	 		1	-	111	1		1	11	1	111	Ħ	Ħ	H	i
11	1		1	,	11.	П		11		11	111	11	T	т	Ī
14		Tat to 12' with int				T		11	1	• 1		1.		П	Ī
13		Jat to 12' with jet		i	11.	1		11		:1		1.	1	П	
14						I		11	3 1			1:			
17	1		1_		•	1			- 1	1		11	I	1	
- 14				i		1		_	_	1	_	1.	_	1	ı
	13		1	SANSON S	0	4	_	1	+ 1	1	1 1	11	╀	#	-
10	13		1	1	0	4		11	+ -	4	111	+	11	щ	H
_L	15		-	+		4		-	1	11		+	¥.	щ	H
	15	SP HIMA	-	+		#	+	-	-	11	1	-	+	-	ř
	15	Se Byene	-	+	10	,†	-		-	-	1	÷	H	H	i
11	112		1	i		ST	7		1	1	111	-	1	H	ī
- 11	13		1	1	EUROPERCUC FIRE	o i	-1	11	1.	. 1	3.7	11	ī	11	Ī
v	21		1		T		0	- 1	1	11		11	1		ē
14	20		1	T	2 1	10	, 1	1	:	11	1			1	Ī
	21		1	T			0	•	1	١.		+		1	Ī
20	AS.		1	1	•	1		0	1	11	1 :	L	1		
21	34	57 black	1	11	1	1	- 1		10	-		11	1	Ш	
"	3/4		1 .	Ц	1.	1	_	-	1	e.	1	11	11	ш	Ц
1)	49	Hennes doubt burging	1	1	-	-		. 1	1 :	-	-	44	1		-
	97		+	+	. 1 .	+	-		++	-		4	+	-	
- 23	8/25	9:25	+	+	-	+	+	1	+	-	++	-	+	Н	8
	E Jan	1.43	+	+	-	+	-	1.	+	11	+++	+	#	H	i
			1	+	T	1	T	1	1	++	11	+	++	#	ī
			1	1	11	1	- 1	1	11	11	1	11	T	1	i
			T		11	1	-1	1	T	11	Ti	11	1	П	Ī
-	Beat	-erts No	•		•	10	0		0	2	00	-	30		_
100-00W	No E	A DAY AL			0	-	٠.	it's	. K	'n					
						20	de.	4							
		= 04% N	. 4												
		04%N			٧.	a.		4	~	,,,,			45		1

6) 6-1 7 9 9 9 9 9 9 11 12 13 14		Pile Sink 12'; gile removed because of micorrect positioning; pile sinks 10'. Organic matter in mask at 10'	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				Ī	H	H			H	H	Ŧ	H
	STATISTICS OF THE PARTY IN	Pile sink 12'; gile removed because of micorrect positioning; pile sinks 10'. Organic matter of mask			#	#	ļ.	Щ	Щ	Щ	世	世	Ш	†	Н
	STATISTICS OF THE PARTY IN	ple stake 10'. Organic matter of uses	ii		H	Ħ	+	#	H÷	++	-	н			
	STATISTICS OF THE PARTY IN	ple stake 10'. Organic matter of mach	ii		H	1.							ш	T	Н
9 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	STATISTICS OF THE PARTY IN	Organic matter in which	ii	-		TI	H	+++	Ht	H	##	H	Н	+	Н
4 2 4 4 11 12 13	STATISTICS OF THE PARTY IN	Organic matter in mach	ii	-	++	#	н	₩	##	H	++	н	Н	+	μ
2 9 -9 -11 11 12 -13 -15	STATISTICS OF THE PARTY IN		ii		H÷	₩	H	##	++	4	++	н	Н	+	μ
9 9 11 12 13 15	STATISTICS OF THE PARTY IN		it	-	++	++	÷	H÷	++	-	++	Н	Н	+	Н
9 21 12 13 13 15	STATISTICS OF THE PARTY IN	w 70,		-	Ħ	#	+	HH	H÷	+	++	н	Н	+	Н
11 11 11 11 11 11 11 11 11 11 11 11 11	STATISTICS OF THE PARTY IN		1	11	HŦ	++	+	#	₩	H	++	н	Н	+	Н
18 19 19	STATISTICS OF THE PARTY IN		-	4	++	++	4	Н÷	++	Н	++	ж	Н	+	Н
18 19 19	STATISTICS OF THE PARTY IN		5	-	**	++	+	++	11	Н	++	H	Н	÷	Н
19			6	-	++	H	-	-	++		**	н	H	+	Н
19	-		6	-	11	+	-	11	-	-	-	Н	H	+	Н
13	*		-	-	-	+		-	-	H	+	-	Н	+	Н
-	10		-	-	-	-	-		+	-	+	-		+	Н
	10	stoned efter 14 blance	-	-	-	+		==	-	+	-	+	H	+	Н
	- **	THE ALTER TO BIANT	-	-	-	+	-	0		+	-	-	-	÷	Н
	21		1	1	7	_	-	0	-	-	-	1	1	÷	Н
	25		-	+	-	+	-	6	-	+	. 1			+	Н
10	26_		-	T	+	-		0	-	1	++			+	Н
-10	41	77 -17-	-	T	+	1	-	-	0	1	-	-	11	+	Н
	37	led blymin	-	+	-	+	-	-	1	++	-	÷	-	+	Н
	77		-	-	-	-		-	-	11	-	-	11	T	Н
	47		-	-	_	-	-	11	1	1				+	Н
19	51		1	5	1	T		1.5	1	1	11	1		T	Н
11	41	63 Allmia	T	-		7	-	11		-		1	11	T	Н
· ·	50		1	-	-	+		. 1	+	11	THE OWNER OF THE OWNER OWNE	11	11	0	Н
-	90	should driving at 1840	ī	T		7		1.8	T	1	,		11		Н
	71	Ter to 28' milh elan	1	1	-	-		1	1	1 .	2			-	H
20	15	Sade	1	1	-	T		11.	1	11	. 6		11		П
24	45		1	1	1	7			1	-1	C	T	Ti	1	П
21	21	ES NIMIA	1		1 .	1		1:1	T		1	11	П		П
	22		1 -	T				111	1.	1 1		П	11	*	П
39	25			• 1	- 1			11	11	1 1		П		÷	
25	10	18:65	1		11			113	11	11	11		П	L	
			1	. 1	1	- 1		11	1		11			I	U
			1	1				1	-		П		\equiv	I	L
			1		1		-	110			П			I	D
				1	-	11	-		=		11		-	I	U
			1	1	1			1	Ш	11		1		D	U
Segrand M		- Notes.	•	•	0.00	5	200	7 7 7	, k	P	~		~		

Pile Type OAK Pile length 43		Vulcan V-1 15,000		18 0 1 28
Grand al. Treach Love	· obenting fate	60 bl/min	I as postde	- Aggarwal!
DAN IN TRA		ODenna Ream	- asa 'N	164 17

Depth :	Blows	Remorts		in.	esista.		61/64 40 80	, "
0-1		During prestture organ	11 40	1111				Ш
1		matter in claim biask,	1111	1111				
		water chauses from						
•		grey to brown to grey.	1111		mm			$\Pi\Pi\Pi$
-	1	03	11	1111	11111	1111	11111	*****
	1-1-		1111	1111	11111	11-1	111111	11111
1	-	Pile sinks 9'8" pile	11.1	1111	11111	1111	11111	$\Pi\Pi$
•	1	cosition 8" W	1111	TTTT		111	111111	$\Pi\Pi$
. 1	i	1	TITT	$\Pi\Pi\Pi$	11111	111	11111	ППП
	1 1		1111	1111	1111	1111	11111	\mathbf{m}
-	-	Jet to 12' with jet		1111	1111	1111	11111	1111
- 11		De E side	1 1	1111	1111	1 1 1 1	11111	11111
		1	,	11:1	111	1 11	11111	1111
14		1	1.1	3111	7.4	. 11	11.	
13		1		11.1	111	1 :	1111	. 1111
16					111		111	TITT
17		20:13		- 1		11-1		1111
14	19	1	1 1	1 6			3.11	TILL
19	23		1 1 1	1 1	0	411	1 1 1	
10	82		4 3 1	1 1	0 1	3 : 1	1111	
14	26	59 bl/mw	17 1	!	1.10	1 1	111	1111
11	.30	1-1 11/11/11	1	1	11.	1 1 1	3.1.1.1	1111
ii	99	To be from	- 1	1 - 11		1 1	Till	1111
11	14	T/		1 - 1	1111	1 1		1111
15	50	Te HION	1 . 1	1	1 1 -	1 1	11110	1111
16	44	52 W/min	! .	1	- 111	1	011	1 ! ! !
W.	58	57 W/min 57 bl/min	1 .	1	1 4	1 1	1.1	11.0
ш	22		1 1	1			1 '	11.1
	24	Jet to 26'; clay leaves;	20:20		0	1 1	1: :	11.1
>•	40	orace sed organic matter	20:30	11.1	111.	1	0.11	1111
21	40	Nu mach 21:00	1	1 1	, ,	1.	0 .11	1111
31	50		1	1 . 1	1:1	1	1110	LLIL
- 11	22		1 1	11	111	1,1	11 111	11:11
34_	80		1 11	.11,	11,	111		
35	95	21:05	1 1	11.1	1111	1111	1111	
			1	11:1	.11	111	11111	1111
			1 11	1 -	1111		$\Pi\Pi\Pi$	$\Pi\Pi$
-				-1.1	1111			Ш
			1 (111			1111	Ш
			1 1	111	111	1111	11111	11111

bynama men	-meants ye	6	•		100			250
OI LPDA)		Nates.		0	Restri	ity, k	*	
	=	on lifting tea	4		Jethin		K	
		caves in the	T E.O. 0					1481
WCC, 170 815		+17.	N					10-170
	ML IIIA	8.8 %						

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST

Pile Type OAK
Pile length 42'4"
Grand al. Treach Level

TON. 03 01 160 1 7500

PILE DRIVING RECORD

15,000 Date 19 Oct 28 Hemmer country pate 60 lallerin Formater - Aggardi

Depth	Blows	Remorts	0.0	es				*	•	1	21	*-		*	1
0-1		1 17:00	111		11	Π	Π	Ш	Ш	11	Ш	П	\perp	\blacksquare	3
t				1	-	11	Ш	Ш	11	11	111	11	Ш		
					11	11	11	Ш		11	111	11	Ш	Ш	
•		Pile sunta 96"	111	:	11	11	П	Ш		11	111	11	Ш	П	
\$	1	1	111	*	TT	II	П	П	11	TT	111	TT	П	П	
	1		111		11	II	II		11	1	11	TT	П	П	3
3			11	1	II	Π	I	m	11	11		Π	п	П]
•	1				Π	11		Ш	11	!	11	Π			
1			111	1	Ш	П	П	ш		П	11	Π		П	
	1 1		1.	1	11	11	1		11	П	Ш	Π			
ii.		Jet to 15' with let en	1	1	1.1	11	ì		1 1	П	111	11			
11		JET to 15' with jet on		*	11	. 1	1	1	8 1	11	" 1	Π]
13				4	11	1		11		11	1	11	1	Ш	
14					1			1.0	1	11		11		Ш	4
13	1 1	1_17:57		+.	1 1	. 1		11	*	1	. 1	1			V
16	15	Pile unling NW; jet				1		11	3 8	1		1:	11		
17		1 20'	1			1			- 1	-	1.5	11	11	11	1
18	2	1	0	1	1	1		1		1	_	11	1	Ш	
19	12		1:	1	10	1		1 .	+ 1	1	11	11	L	Щ	4
10	21		1	i		!		•	1 5	1	1	11	1	Ш	
N	35	158 bl/min			1 2	1		1	LIS	1	1	11	1	11	1
-11	73			1		1			8 1	11	0	11	1	Ш	1
LI	70	59 bl/min		1	1	1		* .		11	11	11	1	Ш	0
14	64	,	-	1	1.	1	,	11	1		1	11		Щ	-8
15	77	SE MIMIN	1	1	1	1	_	13	1	1	13	1:	1	Щ	1
16	63	Jet has' with jeton	18 6	0	-	1	1	11	1 -	1		11	-	11	ъ
· W	66	Sside; organic matter		2	-	1	1		1	11	4	11	1		Р
-11	61	IN WASH	1	1	-	- 1		-	3	11	1	_	1		15
10	105	Tet to at '4" with pet	1	-		-	_	-	_	1	1	-	_		10
20	90	ou SE side	-	1	1	1	-	-	+	4	-	1	+	-	-6
21	85		-	+	1	+	-	-	4	1	-	11	+	+	15
1.	14		-	+	1	1	-	-	+	+	+	++	1	+	1
- 11	115	Driving slopped at 13' w	11:3		-	-	-	1	11	-	-	++	+	-	Ю
		order to aust claning to	-	+		-	-	-	++	1	+	+	+	1	1
- 25	-	entry 30 ang	-	+	+	+	-	+	++	11	++	+	+	+	+
-			-	+		- 1	-	1.	-	1	++	+	+	+	1
			1	+	-	+	+	-	+	++	H	#	+	+	1
*			+	+	-	1 1	+	+	+	++	++	++	H	+	1
		The second secon	-	÷	-	-	-	+	+++	+	++	++	H	+	4
-	1		1	-		-	-	-	10	1	-	11	-	П	

Dyname Mes	.meants	. 4.4.			Do	
01 (PDA)			' at E.O.O.	Restr	to kip	
WCL, 170 816	Phase W	T. 8%	.E			

ANY IT W

TON. 03 01 160 1.7800

Vulcan VI 19 Oct 28 Dote Pile Type OAK
Pile length 42'5" Hammer Energy. 15,000 1925 - 2105 Time operating pate 60 blowin Isspector - Agaze was Grand al. Treach lose 24 20 11 11 11 Remorks B10-5 CA During prejetting organic -depti : grave) at 22 - 27 . Clay lemes in return west . Pile Sints 8' 1111 20:33 1111 Jet to 17' 1111 12 15 4 20:40 1111 0 20:43 18 111 0 18 10 0 . 23 14 10 84 11 32 39 0 57 blimin 11 14 0 12 25 D11 111 24 13 Ø · u 25 21 .. 20 26 30 21 . .. 56 104 120 21:03 32/6 restrice 10/21/78 before the Dept. He Ocapecity, Kips Pile white of can · Restrike **▽** Jetting depth

WCC, TTC BLS, Phose II VOL WA

0 2% W

Dapth "	210-5	Remarks	:	-	120		3.	+-		•	21/	A .		*	-
0-1		During prejetting, 2215	111	1	11	П	II	Ш	H	Ш	111	II	11	П	Д
		organic matter in	₩		##	++	#	Ш	₩	!!!	1!!	#	₩	H	Н
		cetica wash at 10; clay	111	1 .	H	H	₩	++	H	+++	+++	++	₩	₩	Н
•		kuses at 12; more	+++	-	##	#	#	1	₩	+++	+!!	#	#	ш	Н
		organic matter at at	1		##	#	H	+++	Ħ	; ; ;	+++	#	#	Н	Н
<u> </u>	-	tox6.	11	-	Hi	tt	ti	H	Ħ	ini	1::	#	Ħ	H	Н
	1	Pile sints 9'	11	11	Ħ	11	1	11	Ħ	III	111	11	#	H	П
1		THE SHORE	111	II	H	11	T	III	IT	111	111	11	П	П	П
	1		11.	. 1	1	II	T	11	T	111	Ш	II	п	П	
ii.		Jet to 14'	1	1	Ξ	11	1	11		111	111	11	П	11	
			1.	+	11	"	1	1	1	111	111	11	11	Ш	Ц
11			1	1	11	4	_	111	1	1!	11	11	1	Ш	Н
14	<u> </u>		6	-	1	+	-	11	÷		1	+	+	#	Н
13	2_	21.45		-	-	+	-	**	+		+	11	+		Н
- 14	18		+-	-	0	+	1	-	+	1	1	++	H	_	Н
18	24	155 bl/min	1	1	1	1	1		1	1	-	1	T	11	d
19	32	i supraise	11	T		1		1.	1	1 10	11	11		il	I
10	46	The state of the s	1 7	1	1	1	1	11	1		11	•	1	Ш	
u	53	56 bl/min	1	1	1 '	1		11	1	. 1		11	-	1	
u	42			1		1			11	111	11	11	1	11	Ц
11	62		-	-	-	+	1		1	-11	1	4	1	11	Н
14	66		-	-	-	+	-	+ 1	+	+	+++	++	t	#	Н
-15	76	T. (1 22 4	1	-	-		1	111	6	-	11	11	ti	11	H
12	31	Tet to 22'; organic matter	14.	-	1	1	1	11	T	: 1	+	11	-	0	Н
. 11	25	IN IT DIE WAS	1	T		1	1	. 1	1	1	1	1	T	11	П
	95			1			1		1	٠.	1	1	1	1	
>•	125	Jet to 21'4" PORANK	1	1				1 .	L	11	1 : 1	I	1	1:	
21	94	matter in return Mach	1	1	. 1	1	L	. 1	11	- 1	٠.	11	11	11	Ц
),	175	Tet to ale	1	1	1.	1	1	111	11	4	1	11	11	Li.	Н
- 1)	154	Stop driving at 33' 23	PD_	+	-	-	+	111	11	+	-	++	++	-	Н
31	20%	restrice 10/61/72	+	+	H	+	+	1 1	H	111	+::	#	₩	+	Н
-37		ple has been to	1	-	+	+	+	1	+	111	111	#	#	H	Н
	-	Caboning a lot of energy	5	11	1		1	111	1	111	Ħi	1	#	it	i
			1	T		11	T	11.	T	111	111	1	11	H	Ī
				-	1	II	!		I	Ш		II	II	П	U
			1			11		11	П	LU	111	11	П	П	U
	Mersun Ho 1	Motes.				C.	25	-		et.		N.	,		

Apth .	Blows	Remorts	1 0 De	Res	. sta	1	1/64	-
C4	210-5		· 2	, KC 20		0 4		
0-1		Ducina prejecting come			1111		!!!!!	1111
1		mater in treating, come	1111	!!!!!	!!!!!	1111		1111
		Sulls D'e"; pile detracto	111.	11111	!!!!!	4!!!	!!!!!	11!!
•		because of improper	1111	111111	1111	1111	11111	Ш
		positionino; rejet hole	1111	11111	1111	1111	1111	1111
•		00	11:1	11111	1111	1111	11111	1111
2		File SINKS 8'	1111	11111	!!!!!	1:::	+++++	++++
•	141		11111	111111	!!!!!	1111	!!!!!	
1	2		0111	11111	1111			++++
	3		0 !!					++++
	9		0	+++++	1111	1111		+++
	1_3_		0	1111	111	111	Hill	::::
	5		-	6	1	111	11.	
14	19		1	11	10	1 1	1111	111
15	1 33		-	. 1	111	-	111	1111
- 10	93	Checked pile position	1		1	99	1,11	1111
14	78	1 put pour	1	1	1	1.1	10	1111
19	1 48	1	1111		111	. : * 1	: 110	11
10	55		1 1	1 1	1 1 1	1111	1111	· 6
N	55	Vet to 20' with jet on	02 45	1	1 1 1	1:11	-111	10
11	30	15 side	. (1 . (1111	1111	111
11	85		1	1 1		0	1111	11
14	44		- 11	1 1	1111	1	0	3.1.1
25	35		+ +	1	1 1 1	101	1111	111
16	31		+	1	1 1 1 1		0	11.
u	45		1 1		-	1 11	0	-
	79		++-+		-		- 6	10
	121	Jet to 84' 03 00	1	. 1	1	1 11	1.11	11:
31	188	DEL 10 84 03 00	11		. 1	1 -1	1 - 11	111
31	172	Jet to 28's pressur	11 1	1 1	11:1	1.1.	1.11	111
**	100/65	matter in wath of is	1 1		111	1,1:	: 11	111
34	504.		1 11	.11,	111	1111	111	111
35			1::1	11:1	- 111	1111	1111	111
			11-11	11:1	:11-	111	11111	1111
			1 1	1:11	1111	1111	11111	1111
			11	1:1	1111	1111	++++	1111
			1	- ; ; ;	-11	1111	tiiit	++++
	1		-	0 /6	STREET, STREET, STREET, ST.			50
	messur			D C-1				
Segrana		Depth Ti		· Res		P As		
		_ Pile Notes it e.e.	0.					
		4.4% 5		D 2.4	und .	rebun.	1 40	1

TON- 03 OT 160 T 8200

Pietipe Dak	Hammer	Volcan V-1	Date	200128
Pile length 42'		15,000_		
Grand al. Jecarch hosel	. operating Rate	60 blowin	. Em putde	Tso
		-		

Ci Ci	B10-3	Remarks	0 3	**	?	R	20	.+-				-1/	64	-		*	1
0-1		During Dreeting, logito	111	1	11	11	II	111	Π	T		T	П	I			1
•		Coming to the return	111	1	11	11	11	Ш	H	11		1	П	П		П	
		wash from 16' to 35'	111	. 1	11	11	11		П	11		1	11		п	П	
•		wood prices from as'to.	111	1	11	11	II	Π	П	11		П	11	1	п	П	7
•	1 1	33'	11	į.	11	Ti	11	111	11	11	T	T	11	Ħ	П		1
			, 1:	1	11	11	TT	111	11	1	1	-	11	11			1
_ 1	1	Pur sinks 14'	11	:1	11	11	11	111	11	: 1	1		11	T	П	T	
•	1 1	1111 .3122.11	111		Ti	11	11	П	Ti	11	T	T	11	T	П	П	1
- 1	i		TIT	īŤ	11	11	11	H	Ħ	Ti	T	T	T	T	П	П	٦
			7.1	1	Ti	11	T	111	1	11	T	T	Ħ	11	П	1	1
11			1	11	11	11	TT	111	1	1	1	1	11	T	П	П	1
- 11			11	1	11	11	T	1	1	11	1	1	11	T	T	T	1
13			4.6	1	11	11	1	111	1	-	1	1	11	T	1	T	1
14			1	,	: 1	- 1	1	1	17	- 1	T		11	-		П	1
13	1			T		1	1	111	1:		T	- 1	11	-	1	T	1
16			THE OWNER OF THE	1		1	1	11.	1	1	1		1	:	1	11	1
. 7	1.4		a control of the section	1		1	1	1	1	1	1		. 1	1	1	11	1
14	118			11	1	1	1	1 -	T		1		1	1	1	11	1
19	1 1		1	T	!	1	1	11.	1.	1 1	T	t	11	1		П	1
10			1.1	T	1	1	1	11	T	4 1	1	1	11	+	•	I	7
N	4		0	T	1 '	1	1		Ti	. 1	1		11		1	T	7
II.	Ÿ		0	11	CANCEL COM	. 1	1	1	11	11	1	1	: 1	1	1	1	1
ii	5		0	1	1 .	1	1	1 .	T	1	1	à	11	1		1	1
24	2		G		1	1	1	1	T		1	1	11	1	4		1
15	16	and the second s	1	1	1	0		1 1	Li		1	ŧ	11	4	1 1	1	
16	25	The state of the s	1		1	1	G	it	T	. 1	1	- A	11	1	1	1	1
12	29			. 1	1	- 1	1	. (1		1	A	1		1		
18	35		1 .	11	+ "	. 1	T	1 . 1	T	0		1	1		1	1	7
	21			1				1	T				,				J
	57/6		1	1		-		11.	1	1	1		1		11	:	
21	143/145	Jet to 38' with set ON NE ande.	1 .	1	1	-		. 1	H		1		1	1	1	1	J
,,	30	Jet to 40' with at an Wish	1 :	П	1:	1		1:1	•			1	1	-		L	
- 1)		Pile walks 3" Mouring	1	П	11			1:1	1	+ 1	6	1	1	1	1	1	
٠,٠	+	driving	1 1	П	11	٠,		111	I	1 :	1	ì	1				4
35	23.		1	П	11	1	G	11	1	1	1	:	11	1		1	J
	34/	restrict 10/21/12	1 1	1	- 1	. 1		11	L	11	1	1	11		1)
	1		1 1	П	1	: 1	1	111		11	1	I	11		I		1
			1		1	. !	II	11	I	1	T	I					J\
			1	П		11		11	Li	\coprod	1	1	П	1			1
					- 1	1 .	1		II	11	1	1	1 1	1	1	Ti	1

legrone No	Depth H	Capacity kips
	- Notes: + ca	o. Restrike
	= 11. 11.5	VIH we deth
		√ Jetting depth
CC, 476 816	· make m	
	Value	

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAW NO. 28 PRE DRIVING EFFECTS TEST

FON. 03 01 160 1 8300

PILE DRIVING RECORD 20 Oct 25 Pile Type Oak
Pile length 42' Vulcau V-1 Date Hammer 15,000 Time 1015-1150 Energy. operating pate 60 bl/min Imputer Tso Grand al. Treach Level Strain Les arance bijes Darth Remorts B10-3 64 guite and lines -offices in refuce wash From 30' to 30'; clau . pers from 12 b 25 11111111 Pile SINKS 25' .. 14 111 111 . . 14 . 111 20 1111 M 11 111 .. . 111 1111 11 0 24 u 24 11 52 How 47 .. 58 bijona 10.45
Jet to 30' with jet on SE
and DE: make I am Jones
Pik walts 3' y to S . 59 31 . 11:50 30 51/0 restrice 10/21/72 OI GOA) 35-34 O Capecity, Kips 01(200) · Restrike Notes . 1.1% N 20.0 both & Jething depth 6.0% E --

WEL, TTO BIS, Those II A

TON. 08 DT 160 T 84CO

ile to	ath _	DAK Hammer Ha' Energy Lies opening pat	1	5.	00	¥-1	_	7	ده لمنه رسم مهاد		135	Or TSO	145	U
ca .	B10-5	Remorts		"	(2)		20	.+-	~ · · ·	40	4		•	1
0-1		During presetting,	111	1	Ш	11	11	111	$\Pi \Pi$	1!!	11	11	#	1
•		wood pieces and	1111	4	11	#	#	##	1111	4!!	++	##	44	1
		loute to return wash	111	-	Н	++	#	111	1111	4	++	##	++	1
4			111	1	Ш	11	11	Ш	1111	111	11	111	11	1
			11	1	Ш	11	Ш	111	1111	111	11	111	44	1
•			111	1	Ш	11	11	111	111	111	11	#	11	1
2			11:	1	Щ	11	11	111	1:11	111	41	Ш	44	1
•			111	1	Ш	11	11	Ш	111	111	11	Ш	11	1
9			111	1	Ш	11	11	Ш	1111	111	11	ш	44	1
			1.1	1	-	11	11	111	111	111	11	111	11	1
11			1 '	1	11	11	1,	111	111	111	11	111	Щ	1
			* *	1	11	11	1	11.	111	111	11	111	111	1
				1	11	11	1	111	1 1	111	11	11	Щ	1
14			,	1	11	1	L	1 .	1 - 1	1	1.		11	1
13		Pile Sinks 24'			1 1	1		111	1 :1		1:	1	11	ı
16				1	_	1	1	1:1	6.1	1	1	11	11	1
.,		1	-		1		1	1	. 1 .	1	11	1	Щ	1
-14		1		1	-	1	1	1			1	1	11	1
19			1	1	1	1	1	11.	4 1 7	11	11	1	11	1
10		From 80' to 25' liquite	1 1	1	L	1	L	11	1 - 1	111	11	1	Щ	1
u		Icomes up with Teture	1.	1		1	L	111	1 - 1		11	11	Ш	1
-11		lwach '	-	1	_	1			111		11	1	Ш	1
ш				1	-	1	L	1.	1 1	11	11	1	11	1
1.			-	1	1	1	1	1		111	11	111	Ш	1
11	5		1.0	1	1	1	1	1 : 1	1	11	-	111	11	1
11	9		1			1	1	111	1 - 1	1	11	11	Щ	1
u.	16		and the second		-	01		111	1 :	1	11	1	-	1
28	al		1	1		1	D.		. '	1	1	11	'	1
	26	54 6 /min	-	1	1 1	-	1		1 1	1-	-	1	-	+
,.	33		-	1	1	1	1	1	0	1	1	11	1	1
21	42		-	1	-	1	1	- 1	11	10	11	11	4	1
).	71	A CONTRACT MARKET CONTRACT CON	1	1	L	1	1	111	1	1.6	4!	11	1	1
- 11	53		1	1	1	-	1	1:1	11.1	1	11	10	1	1
30	45	AND ALL PROPERTY OF THE PARTY O	1	1	11	-	1	111	1111	11.	11	11	11	F
35	81		-	L	11	1	1	111	111	11	44	11	11	K
	44/4.	restrice 10/21/78	1 1	1		1	1	11.		111	1	11	11	۴
			1 1	1		: 1		111	111	111	11	11	Ш	1

			1	#	+		1	#	
DI (SDV)	30:35	3.1% N		,	Pa	po- thin	te	÷	

TON. 03 01 160 T 8500

Pie Tipe Oak	Hammer	Valcan V-1	Date an oct 21
Pile length 42'	Energy	15,000	Time 1600 - 1650
Grand al. Treuch Level	· obieting fore	60 Warn	Empeter Iso

Ci Ci	210-2	Remarks	0.0				5		1-	-	•	40	10	٠.		*	1
0-1	1 1	hank returned in	111	T	IT	IT	II	II	II	IT	Ti	II	П	IT	TI	IT	П
-	1	hants refuched in d'	111	1	1	11	11	II	II	11	11		11	II	11	11	П
		1.4.4	111		1	11	11	11	11	11	111	IT	11	11	IT	IT	п
•	1	i	111	1	T	IT	11	11	11	Ħ	11	T	11	IT	11	IT	п
THE REAL PROPERTY.	1		111	-	H	+	H	H	÷	++	11	н	+	H	H	H	н
	+		1.1	-	+	1	H	H	++	H	-	Н	1	H	H	+	н
	-		111	-	H	1	Ħ	Ħ	ti	ti	11	1	-	H	Ħ	Ħ	н
	1	Pile sinks 25'	111		t	1	H	Ħ	Ħ	Ħ	111		1	H	H	Ħ	н
-	-	FILE SINKS AND	111		Н	**	H	H	Ħ	t	1	н	+	H	H	H	н
	1 +		-	÷	1	-	H	1	++	H	1		1	+	H	H	н
			-	+	÷	+	H	H	++	H	1	Н	+	+	H	1	н
- 11		-	-	+	÷	+	+	+	-	+		+	-	+	÷	+	н
-11	-	•	-	-	1	-	1	+	+	-	-	+	1	+	+	+	Н
	-	-		-	÷		+	+		-	-	+	-	-	-	+	H
14	-	-	-	-	-	-	+	+	-	+	-	+	+	-	-	+	Н
13	-	0. 11 1. 101		-	-	-	1	1	11	-	-	1	-		+	1	H
	++-	At 16's17' Wood pieces.	-	-	-	-	+	÷		-	-	+	-	-	+	+	н
- ''		returned in wash	-	-	-		+	+	-	-	-	+	-	-	÷	+	н
	-			+	-	-	H	+	-	-	-	+	-	-	-	+	н
	1			+		-	+	+	-	-	-	+	-		-	+	н
1.	1	At 19 1 23' liague	-	-	L		+	+	-	1		4	1		-	11	н
L		I returned in which		1	-	-	1	+	-	1	1	4	1	11	-	Ц.	н
	++-	1	-	1	-	-	1	1		1	-	4	1	1	1	1	н
-11	-		-	-	1	-	4	- !		1		+	11	-	-	-	Н
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	15		1	1		0	1	1	-	Ŀ	-	1	-	-	1	1	4
	13		-	1	0	-	1	-	-	-	-	+		-	_	1	H
>•	13	1.1	-	1	0	-	4	1	-	1	1	1	1		1	-	Ц
21	17	1440	1	+	-	0	initial in the	-	1	11	-	+	- 3	11.	1	1	H
"	22		-	1	1	-	119)	1	1		+	-	1	1	1	H
- 11	34	SE DIMIN	-	+	_	-	1	1	1			1		1	1	_	H
34	45	1650/	-	+	1	-	1	1	11	1	111	1	0	4	4	1	4
35	29/5	restrice 10/21/72	-	1	1	1	4	1	11	1	111	1	1	1	4	1	4
			1 1	1	-	1	4	1	1		111	1	1	1	1	11	4
			1 '	1	_		4	1	11	1	111		1	1	4	1	Н
	-		1	1	_	-	4	4	11	1	Ш	1	11	11	4	1	H
	-		1	-	_	1	1	1	-	1	11		1	1	4	1	4
			1			11:			•		11		1	11		T	

bynama mes	someonts yes	, •	50	100	Bo	-
medianes me	DE PARTY.		0	Cape.	ity k	+
		Hotel of coo	V	JeH.	ng des	*
WE . V7C B1C	Phone II	1.8% €				

VOL I A

WOODWARD-CLYDE CONSULTANTS
LOCKS AND DAW NO. 26
PRE DRIVING EFFECTS TEST

pth.	B10-2	Remarks	O De	ATT.	× &	***	nei Î	40	1)64			-
	-	During Projecting 2	11111	1111	##	111	HH	#	H	H	+	H
·	1	return wash	1111	1111	111	111		П	111	111	T	Ħ
•			11111	Ш	Ш	Ш	$\Pi\Pi$	Ш	111	Ш	П	I
3		Pile sinks II'		Ш	111	111		Ш	11	Ш	\mathbf{I}	П
•			1111	1!!!	11!	##	11	#	!!!	##	+	Н
2			11111	++++	##	+++	111	++	H	H	H	H
-			11111	1111	Hi	+++	iii	Ħ	H	Hi	H	H
1			11111	1111	#	111	++	1	TIT	$\dagger\dagger$	T	H
-	1		1 - 1	1111	111	111	111	I	111	Ш	I	П
"	3			-	11	1 -	1 1	1	!!!	111	11	Ц
11	10		1 1	1111	11	111		+	111	4	1	Н
14	-		-	1	+	111	COMMUNICATION.	#	++	+	+	H
13	-	Jei to 19		-	+	Ti	1	+			+	H
••		in Lui		1	I	1 :	, 1	T		T	T	П
14					11	1		1	1	1 1	11	-
1.			11	+-		+1:	111	+	+++	+	+	-
1.	6			1 6	11	1	1 1	+	+++	+		Н
L.	15		-	-	1	+	-	+	- 1	+	+	Н
H	20			-	il.	10		1	111		11	it
14	33 40		* 1 1	1111	11.	111		1	111		-	П
15	40		1 . 1	1	11	111	1	and the	111	-	11	4
14	37			+	#	111	-		CONTRACTOR OF THE	+ !	-	4
¥	46		1	1	1	1	1	-	1 0	-		1
11	24		111			1 7		1		+	1	1
2.	84		1		1	11.		1			1	1
21	110		1	1	11	1 1	1	1		111	+	4
	119		-	++-	4	111	-	+	++	+++	+	Н
31	139		1	1.1	+	111	11	1	111	++	+	1
35	(4)	00 A5	11:11	111	1	111	Πī		111	11	T	I
-	56/6.	restrike 10/21/71	1 11	THE PERSON NAMED IN	11	11.	11	П	111	Ш	I	П
-			1 '	1	11:	111	111	1	111	111	1	H
				+-;	+++	11.	+++	+	##	#	+	Н
-	1		1	111	-	11	111	#	##	#	+	H
^		No	-	50	100	STATE OF THE PARTY NAMED IN	30	20	release teaments	25	•	_
9.000	No. 1	2011-FI		0 (Cap		b Ki	-				
		- Alle better of				rite	-					

V7C-825
Phase ▼; Vol □ A

L.2 COMPLETE FIELD LOGS OF INSTALLATION OF TIMBER PILES UNDER MONOLITH MI

The field logs are presented in chronological order of timber pile installation (the timber pile number cornesponds to the two digits preceding the last two zeros of the Id. No.)

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 03 01 160 1 1200

2744	Blows	Remorts	100		. 2	23.	.+-	-		51/5	EA	-	=	-
64			1	100		-		-		111	-	10	_	_
0-1		12:50	1111	++	+++	Ħ	##	H	+++	111	#	Ħ	H	t
-	-		1111	1	111	Ħ	##	H	111	tti	11	Ħ	H	t
-	1	ale seak to 6'	1111	Ħ	H	Ħ	111	Ħ	111	Ti	11	Ħ	H	t
		218 3606 70 0	111	1	111	Ħ	Hi	Ħ	111	1;;	#	Ħ	H	H
	-		111:	11	111	1	111	1	1	111	11	Ħ	H	t
2			111	III	Ш	II	Ш	Π	111	111	Π	П	\blacksquare	
•		Jet to 12'; jet pope an	1 ! 1		Ш	1	Ш		111	11!	Π	П		
. 1		Sade	1:1			1	Ш	П	Ш	111	11	Щ	Щ	L
			1.1	1	111	1	111	1	Щ	111	11	#	1	Ļ
11			1	11	111	1	111	1	111	1!!	#	11	Щ	L
"	+	Clay bolk at 12'	-	4:	+	1	11	1	Щ	+++	#	!	ш	H
-11	1		-	-	111	-	1	1	++	1.1	++	+	Н	H
14	12/4		-		•	+-	11	÷	+	+ +	+	-	H	Н
15	22		-	+	-	6	-	-	-	1	11	+	+	۲
10	22		1	1	+	+	0		1	1 1	11	#	1	-
14	22	1			1	1	10	1			11	T	T	Г
19	28		1				10	1	1 . 1	1 1	11		Π	
10	24		111		1		0		1	111	11	1	11	
N	30				1		1 -		11	1	11	1	11	
-11	.34				1	L		0	dente la cons	1 1	11	1	11	L
-	35			-	1	÷	1	1	0	111	44	1	111	L
1.	36		1	-	-	÷	++	+	Q!	+++	++	H	H	H
11	36_	< (1)	1	named and paster	+	+	11	+	0	+++	11	ti	#	Н
12	32	Sandrad wheremon each	- L	1	-	ī	11	+	ě	1	11	t÷		Н
14	78	hammer me fortioning	H	1	1	1	1.1	T	1	1	10	_	1	H
	53	THE HALL TO SERVE TO SERVE	11		- 1	1	1 1		1,	1:	1	To		Ī
	50		1			1		1	11	1 1	L	10	1	
21	.50		1 1		0		1	L	. 1	11	11	DI.	1	
),	52		1	1	0	1	1:1	1	11	1	11	C	L	L
1)	_57		1	1	0	_	111	4		-	#	#	0	Ц
	27	63 A/Am	+++		0	-	1	+	++	++	#	+	-	H
33	110/1	14110	11:	16	0	-	de	4		149	445	H	H	Н
	110/6	restrike 10/20/18	11 1	-		-	111		Hi	111	+	#	Н	H
		The state of the s	1		11	tr	11.		11	111	#	#	H	h
			1		11	Ť	11		Ħ	111	11	T	т	Ħ
			1		1	П	11	T	11	П	11	П	П	П
-	Measure	-ents we	•	50	-	-		30		loo		200		
-	No. 8	ROTH TO		C	C.	P			in					
al CO		4-34 6. 11 Mates :1 6.			120	ste	KE							
DE MEST	m000 -			- 6	73	4.	4.4	ee'	-					

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 03 01 160 1 0400

C)	310-5	Remarks	0 Dr.	1316	25.	.+-	^ 4 6	11	64		*
0-1		15:35	1111	ШП	II	Ш	Ш	III	Ш	Ш	I
1		Jet on SE side	1111	1111	11	Ш	1111	Ш	Ш	111	1
	1	Pile sicks 3'	111.	1111	#	Ш	1111	111	111	Ш	ļ
•		Jet to 12'4" with jet	1111	ШШ	Ш	Ш	Ш	Ш	Ш	Ш.	1
1		ON NE Sale	1111	1111	11	111	111	111	111	111	Į
1			1111	1111	#	11!	11.	111	111	##	ļ
			11:1		#	111	+++	H+	##	₩	ł
			++++		++	##	+++	-	111	₩	ł
1			1111	++++	#	++	1444	++	111	₩	ł
				1111	t÷	+++	111	H÷	##	##	t
-11	-		-	1111	+	1	111	+	#	+++	t
-11	-	Jet to 15' with jet on		1111	1	11	111	1	11	tit	t
11	1	SE SILE	* * *	1111	1	1 1	1 - 1		11.	11	t
15		1		1101	1	11	1		11.	T	T
11	11			0	1	11	11		11:	11	Ī
.,	21				0	1.1	11.		. 1 :	11	1
14	24			1 1	L	10		1	1 27	1	1
19	29		1111	1	1	1 G	111	1	111	1+	ļ
10	36		1	1: 1	-	11	1 3	Ш	111	111	ļ
u	41	57 NAIN	1	1 1	1		1 . 1	E	111	111	ļ
-11	44		- !	-	+	11	1 1 1	+	G	++	÷
ш_	-50		-+	1 1	÷	111	-	Hi		6	÷
14	51		1.11	1	+	11	-		111	16	-
15	23	57 blown	1	1 - 1	1	11	1	GMAN COMPANY	11	10	-
1/	42	LEUMIN	1	1	1	11	1 1	1	16	-	
24	72		1 1	,	1	11	111	1	G	111	-
10	12		1	11 1	1	1	1.1		1	1	
>•	119	16:10	1 11	11.		11.	1 1	1	1	111	-
34	55	Jet to Da' ou NE and SE and		11			1.	1	11	LIE	1
"	65	From 3 to 37'9", hammer	1 ,	1.	Ŀ	1:1	1::	1	11	111	1
11	77	Tracics from 57 to 60 Mp		. 0		111	111	4	0	1!!	-
30			1	40	1	1	111	1	19	+++	į
21	114	16:42	+++	1	-	1	V.F.	7		111	t
	20/0	mestrice 10/80/72	+ +	1	+		-	1	+++	₩	t
			1-1	11	t	11	111	##	H	###	t
			+	111	†	-	111	111	11	tit	t
			1 1	111		1	111	111	111	\mathbf{H}	t
10000		and the			1	4	0	200		20	
-	No E	zenta yes		DC.	-		. Kip				
LLCPO	2 3	10-34'9" N.d.		. 2	est.	ite					
L DEED	CILLIAN S	dit of 5 p. befor at E.	0.0.				rept				

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 20 PILE DRIVING EFFECTS TEST

FON. 03 01 160 7 0700

epth :	Blows	Remorts	0 Dr.		Res	oto.	• • •	40	FA .		*
0-1		1 00 pleases 1'h' and an		###	 	+++	 	1	++	₩	+
-	1	out at poutowie leads; and respect pulled as; Il 25 place	4	##	1111	##	Hit	H	11	Ħ	t
•		licates; remand pile,	11111	\mathbf{m}	Ш	111	III	Ш	TT	Ш	T
		and repositioned.	1111	\mathbf{III}		111	111		\coprod	Ш	T
•			11::	Ш	Ш	11!	11:	1111	\mathbf{H}	Ш	Ψ
2		File Sirika 9:	1111	₩	!	+++	11:1	+++	++	₩	H
•			11111	₩		+++	+++	+++	#	н	H
- 1	-	File walking W	0	+++	111	+++	+++	Hii	#	Ht	H
-	4	Jet to 196; pile walts	10	111	111	111	111		11	Ш	T
	4	2"5:11:00; ergene me Her				1 -	111	111	11	Ш	I
12		wash, caler changes from		111	11	111	1 1	11:1	11	11	H
11		grey in become ad grey	-	11	-	11:		_	1	1	H
15			-	-	-	+++		-	11	11	H
.,					1	1	. 1 .		11	11	T
14				1	I	1 .	1.		11	11	T
19			1 1 1	4	-11	+++	1 1 1	111	++	1	H
10	5/6	19:04	1 1	-	1	1	1 1 1	+	+	++	₩
L	20	56 Nymin	+	+	i.	10	111		1	111	+
#	40	Su Mymin	1	1	11	1	1.1	0.1	11	11	T
14	36		1 - 1	1.	1 1 3	1 1 1		_	11	11	I
_11	.17		1 - 1	1	11	111		111	-	**	÷
31	25	57 bl/ma	++	+	+	9	+	-	11	+	÷
14	23	57 bl/min	11 11	1	11	11	1-1	-	-	11	,
11	60		11 1		\pm	1 1	1 1		1		
30	154-17	Jet Agen 19:15	11 1	1.1	П	111	and the second	1	L	6	-
21	41		1	-	100	September 1985	1 . '	1	119	4	+
	51		-	1	10	+:+	-	++	++	91	4
34	58		1111	11	6	-0	111	11	#	H	
35	12/10	19:45	11:11	III	O	7,1	111		11	Ш	I
	56/6	restrike 10/20/78	1 - 11	1.1	1	+	makes the second	Ш	1	Щ	I
-			1 1	1	-	111	+++	1111	#	##	#
			+	+	111	+++	+++	+++	++	H	Н
-			1	1	-	11	 	111	++	н	۲
	Measure		•	50	100	FIRMS NAMED IN	-	200		30	_
-	No. E	Sent yes		0	Cap		. Kip				
LIPP	41 1	TIO- 36 4 Pile post				rike					

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 FILE DRIVING EFFECTS TEST PLE DRIVING RECORD

TON. 08 01 160 1 2200

Pile Type Danglas Fir	Hemmer	Valen V-1	Date	16 Oct 28
Ale length _ 42'	Energy	15,000	Time	2045 - 220
Grand at Treak Level	· opening fate	60 bl /mi -	Ess being	Aggaculal

Deth.	810-5	Remarks	. F	3			25.	*	-	•	-	1)					
0-1		20145	111	T	TT	П	T	Ш	Ĭ	H	II	Π	TT	II	П	T	ı
-	1		IIII	1	П	П	Π	Ш	П	П	П	П	П	\mathbf{I}	П	П	
-			1111		11	П	Tī	Ш	П	П	П	T	П	П	П		
•	1	Pik SINKS 10'4"	1111	1	Π	П	π	ш	П	Π	П	TI	Π	П	Π	П	
	1-1-	TIE SINKS IN T	111	7	Ħ	Ħ	Ħ	Ħi	11	Ħ	Ħ	11	11	11	Ħ	Ħ	
			111	1	††	Ħ	††	ĦĦ	11	11	Ħ	11	11	11	Ħ	н	
+	1		111	1	Ħ	Ħ	T	Hi	11	: 1	Ħ	11	11	11	П	П	1
-			1111	1	Ħ	Ħ	Ħ	ш	11	11	П	TI	Ħ	Ħ	П	П	ı
-	 		1111	7	Ħ	Ħ	Ħ	Ħ	11	11	Ħ	TT	Ħ	11	П	П	ı
			1111	Ť	11	Ħ	Ť	Hi	11	Ħ	Ħ	TT	Ħ	11	П	Т	ı
	-				TI	11	T	111	T	11	Ħ	11	11	11	П	T	
-11	+		1.11	1	1	11	1	1	1	* 1	1	11	Ti	Ti	TI	Т	
13	+-+-	†		7	11	. 1	T	111	T		11	11	11	T	Ħ	П	
19	1	 	-	1	; ;	. 1	1	17.	1	1	T	1	1.	T	T	T	
13	1	Jet to 19'		7	11	1	1	111	11	1	П	. 1	1	Ti	TI	Т	ı
10	 	THE TALL	1	1	-	7	1	111	T	1	Ħ	-	1	T	11	Т	ı
17	1			1	•	7	1	1	1	1	11		1	T	11	T	
14	1	1		1	1	1	T	1 :	T	1	П		1	1	11		
10	1	21:40	1.1	T	T	7	1	1 :	1	1.1	П	11	Ti	Ι	1	П	W
10	8	Jet to 20'with jet on	100	F	1	1	T	3.1	1	11	П	11	11	T	11	П	N
N	13	Eside		1	6	1	T		II	- 1	II	1	Ti	T	11	П	
-11	18	54 bl/min		1			T		1	1	1	. !	1	1	1 1	П	
-11	21			1	1 -	11	0	1.	I		11	. 1	;	1	11	П	1
11	23			1	1.	1	I	1	1		1	I	1	1	11		
11	22	52 bl/min		1	1	1		0	L	- 1	1	11	1	L	11		ı
86	21		1 .	•	1	1	L	16	1	. 1	1	1	1:	1	"		
N	24				1	1	1	0	11	1	1		1 :	I	1 .		
-14	24		1	1	1	1			1	1	1	1		1	L		
	37		1	U		1	\mathbf{I}	1		_	\mathbf{D}	•	1	I	1	1	1
20	51	22:00	1	1	1.1				1	-	1	1 1	1	D	1	1	ı
21	46		1 .	1		-	L	, ,	_	0	ı	3 4	11	11	1	1	P
	60	60 bl/ain	1 :	1	1	-	1	1.1	11	G	1	1	11	11	L	1	0
-	64		1	1	3		1	1,1	L			1	1	11	1	1	6
29	20		1 1	1	1	: ,	1	111	11	0	-	1	1	11	1	1	P
35	60	22:53	1:	1	11	1	1	111	1	0	빌	11	4	11	1		2
	43/6	restrike 10/20/18	11.	1	1	: 1	1	111		11		11	1	41	4	1	P
			1	1		11	1	111	1	11	1	11	+	11	11	4	1
			1	1	_!	1.1	11	11	1	11	Щ	11	11	11	1	4	1
			1	1	_ !	11	1	11	11	11	1	11	11	4	1	1	ı
			1		1	1 1	1.	11	11	11	1	11	11		1		

Sectors (104) SC-35'6' 0 2% S

O Capacity, kips

Restrike V Je Hing depth

WCL, TTCOIS, Phose W. Vol MA

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

Fon. 08 01 160 1 1100

C)	Blows	Remorts	21	1:	137.	1	3.	*	-		11	4		-	
0-1		10.43	111	Ш	Π	H	H	Ш	Ш	H	Ш	H	H	H	Į
•			##	#	#	Н	Η.	ш	Ш	#	Ш	#	₩	Н	ł
			4#	+-	₩	н	Н	₩	Н	₩	H	H	₩	Н	ł
-		Pile swes 76"	4++	11	ш	н	Н	H÷	Ш	#	ш	#	₩	н	ł
			+++	+	##	Н	H	+++	Н;	#	+:	H	₩	Н	ł
<u> </u>	-		+++	11	HŦ	Н	H	Η÷	H	11	+	++	Ħ	H	t
	-		111	11	ΗŤ	Н	H	H	Hi	Ħ	Hì	11	#	H	Ì
-		To 1 40 12' 11 1	111	ti	Ht	Н	Ħ	H	H	#	Hi	Ħ	Ħ	H	t
		Jet to 12' with jet pips	1	H	11			11	11	#	H	Ħ	11	H	İ
			1	. ;	11	П	i.	11	11	11	III	II	Π	IT	Ţ
11	1		, 1	1			1	1	1	11	11	П	Π	I	Í
13		Tet to 19's" will all pose		11	=	. 1			1	11	1	11	-	П	1
14		LORNE			11				1	11		1.		Ц	Į
13		At 15' waite comes up	1_	i	11	1		11	1	1	11	1	1	Ц	1
-11		- Kinaak	-	-	2.1	4		11	-	+	-	+	++	#	ŧ
-11			-	+	-	+		_	Н	+	-	+	÷	H	ł
			11	+	+	+	3		-	+	-	+	+	H	t
19	-		+	+	+	+		+	+	1	+	Ti	t	H	t
10			+	+	+-	÷		1	+	+	1	1	+	1	t
	29		-	+	-	+		-	1	+	1 1	+	tr	H	t
-11	45	A CONTRACTOR OF THE CONTRACTOR	1	1	1	T	,	1.	1	TI	1	9	1	11	t
31	54			-	1.	T	•	11		1	1 1	11	L	U	I
11	60	63 N/mm; pt 527'	1 -		1	I		11	1	1	11	-	1	-	J
16	33		1		1	1		11	10	1	11	11	-	1 1	1
N	14	Acuse to 246 ft	1	-	10	1	1	11	1	11		11	1	١.	ļ
-11	11	Acres to ave to	11	1	-	1		11	1	11	1		1	1,	1
19	13		+	-	0	-	-		-	++	-	+	+	<u> </u>	t
20	23		+-	+	1.1	4	9	-	+		-	+	++	H	ł
31	32/10"		+	+	+	-		-0	+		-	#	Ħ	0	t
11	22		1	+	+	-		6	5	1	-	11	+		t
31	103	Honor fortand	1	1	. 1			G	0	1 .	1:	11	1	1	Ť
11	22/4	12:00	PI	T	II		*	10	0	11	: [II	Π	I	1
	64/1.	redrike 10/20/72		. 1	1	I	i	1		1	11	II	II	П	Ĭ
				11		1		11.	Ш	11	Ш	Ш	11	П	1
			11	1	7	4	1	1.	Ш	11	111	+!	11	H	1
			1	-	-	4		4	111	14	11	11	#	H	ł
			ĪΤ		-	Щ		_	<u> </u>	щ,	Щ.	щ	4	ш	1
at Co	No E	months the states of the batter of the states of the state			77	Ca		all the	, K	_					

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST

Pile le	ngth &	Hammer Energy Chical Openting Rat	12'	000 000	Loin	T	ine ine ofe	- L	7.0 345	20	16	
C4	210-5	Remerts		ma.			F	61/6				ĺ
0-1		1145 During prejet, jet	1111	HII	Ш	Ш	1111	111	Ш	11	II	1
		loses circulation at 22,	11111	1!!!	4444	Ш	1111	1!!	##	#	#	1
	-	poe goes only to 23;	1111	###	!!!!	444	1111	111	###	++	#	ł
•		much Tigute Coming up	1111	1111	1111	111	1111	111	Ш	11	11	1
3			11	1111	1111	111	1111	11	Ш	11	Щ	1
•		PIC SWE 8	1 1 1 1	1111	1111	11	1111	111	111	11	#	1
			1111	11!!	11!!	###	1::1	111	##	++	#	4
•	1 4		1111	1111	1111	##	1111	111	111		#	1
. 1	1 T		1:11	1111	1111	Ш	1111	111	111	11	44	1
		Jet to 12'4" with jet on	1	111	11:1	11	1111	111	111	11	#	4
11		SE side.	1 1	1111	11.1	11	1111	111	111	11	11	1
11	1 , _		1 2 1	1111	11 1	1	1 : : 1	1.1	111	11	#	k
-11	1 *		1 .	1111	11 1	2.1	1 11	1,1	11	11	11	1
14				111	4	1.1	1 11	1	1 .	1	#	1
13		lails runs to 15 6" but		11.	11	11	1 1	1	1	1	11	1
16	1	Walter 2:5" N	-	1	11	11	111	-	1:	11	Ц	4
17	1		-	1	11 1		11	1	1	11	11	Ļ
14	15		1	10	11 1	-		-	1	1	#	ľ
19	20		1	11	19	1	. 1 .	111	11	-+	#	Į,
10	84		11 1	11	1	1	1:11	1	1.	11	11	ľ
N	25		1 1	1	1	16	1 11	1	11	11	11	٨
L	34		1	1	11 1	-	1 0	1	1	11	#	1
LL	43		-	11:1	11	1		10		11	#	ł
24		Jet to 25'		1	+++	11	+	+++	11	++	#	k
13	38		1	-	11 1	6	1-+	+	1 1	CAMPBELL STREET	++	P
16	28		1 .	-	11:1	•	1	-	-	-	4	ł
W.	24	58 bl/min	-	-	11 6		1	-	-	11	+	ł
	40		1 1	-	11:	-	. 1	91	_	11	1	1
	56	62 bl/min	1	-	-	-		+-	-	-	01	ł
3.	56		+ +		11 1	20	1	-	-	11	91	Ł
31	63	(2.11)	-	1	1 1	0	-	-	11	+	+	ť
31	151	62 N/min		1	+++	- 16	-	1	11	+	+	ť
and the second	86		1	-	+	10	3	1	-	++	+	C
34	80	16:30	1	1	+++	-	1111	1	1	T	1	ť
35	58/4	10 30	1 11	111	1	-	7	11	1	#	11	Ċ
	3.76	restrice 10/20/18	11 11	-	1 1	1	Lud	-	*	44	+	٢
	-		1	-	+++	1	111	+++	++	++	++	1
			1	1	+++	+	1111	11	++	1	#	t
-	1		1 .	1 11	1	1	Hii	tit	1	++	++	1

OLTON 30.34% PON E -

Pestate

▼ Jetting depth

WCC, YTCOIS, Phose II YOU II A

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 03 01 160 1 0500

2014	Blows	Remarks	00	2177	2		.+-	^•		-ij	:4		-	
0-1	-	17:55	1111	Î			щ			Î	T	Î	П	T
t			1111		11		Ш	Π	111	111	П	Π	П	I
				111	11	П	Ш	Ц	111	111	11	П	П	I
•		Pile sinks 10'4"	1111	111	11		111	11	111	111	11	11		ı
3		1	1111	Π	11		Ш	Π	111	111	II	Π	П	I
•			1111	Ш	11	1	Ш	П	11	111	П	Π	П	I
2			1111	111	11	1	111	11	111	111	11	11	1	1
•			1111	111	11	1	Ш	11	111	111	11	11	Ш	L
. 1			1111	111	11	1	111	11	111	111	11	11	Ш	L
			1 1 1 1	111	11	1	111	1	111	1!!	11	#	11	Ļ
11	1		1 1	111	11	+	111	1	111	111	++	1	1	1
"		Jet to 15'; jet no Sode	1	til	11	-	-	+	111	+++	+	+	11	1
13				111		-	111	+	11	1.1	11	1	111	ŀ
14	-		-	1	-	-	111	+		1-1	+-	+	+	H
15	*	I I I I D	-	10	-	-	1	+		+	1	+	+	ŀ
- 1.1	12	Stopped our Birer 5 blans		1	C	-	-	+	1 1	+	11	+	1	t
	22	1		1		G	1	1	1	1	11	T	1	Ť
10	21		11 1	1	1	-		1	1 1	11	11	1	1	t
1.	28	58 bl/m.w	11.1	117	1	0	1 1	T	: 11	111	11	1	IT	Ī
Li	26	- Lipinia	1111	1	- 1		10	T	11	1	TI	TT	11	ľ
11	30		1		1		1.	01	111	11	1	T		Ι
11	20	51 bl/m.w		1 :	11	i.		•	11	11	: 1		11	
2.	45	,	1	1.	11	1	1 . 1	L	0	111	11		11	L
15	41	Leads making up 1 Mount.	1 1	11	1	3	1 1	11	1	0 1	-	1	11	Ļ
16	10	stopped after Il wiens, homes	net !	1	1	1	11	11		•	11	1	1	Ļ
11	36	fallowing terreetly		1			1 1	1	•	1	11	1		L
28	40		1	1		_	-	1	, 11	4	-	1		L
	56	Jet to 23' 18:10	-	+-	-	-		+	1	+	-	-	10	÷
3.	20	11 30		1	-	-		0		-	1	1	1	t
31	66	Stoppers to remove species of	1	-			25	-	All Street Company	+	11	1	1	t
11	29/4.	"under wake, det to jettim.	DAIM		ALD.	-13	111	T	.11	10	TT	1	1	t
34	51	water water, are in joining.	1 11	11	1,		117	11	111	11.	11	0		t
15	28/1	19:35	1 - 1	111	1		111	T	111	160	T	T	IT	-
	74/6	restrike 10/10/11	1 - 1	III	- 1				+KL	Li	II	14:		1
			1 11		11	4	111		Ш	Ш	II	H		1
			1		1	1	1	L	Ш	Ш	II	\prod	Щ	L
			1 1		11	1	11	11	Ш	11:	11	11	Ш	L
			1 1	-	1	Comment	11	-		Ш	and the latest		Ш	L
-	Messur	-ents yes	•	50		100		30		too		250		
ed.eve	No D	FOUNTH		O	Ca	P-		P .	do					
OI CED	MOON !	Bries Pile detati at E	0.0	-	Ke	31	rite							
TE ME SHE		3.6% 5		V	30	tti	7	u	-					

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 20 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 03 01 160 1 020

Pile Type Danalac Est) Hammer	Vulcan V-1	Date	17 oct 18
Pile length 42"	Energy	15,000	Time	2130 + 2315
Grand al. Treach level	. operating Rate	COLVER	E os poetde	- Agganial

Ci Ci	Blows	Remorts	0 D				20	.+-		•	61/	64		*	1
0-1		2130	11:	T	11	T	II	III	II	111	III	11	III		Ճ
1			111	1		11	П	111	T	111	III	TI		П	П
			111	,	11	T	Ti	III	11	111	111	TT	П	П	П
•		Pile sinks 11'8"	1111	1	П	11	11	111	11	111	111	TT	\mathbf{m}	П	П
WOOD OF THE PARTY	-	THE STAND II E	111	-		1	11	11:	++	111	117	++	111	+	н
			11:		+	+	1	H	Ħ	111	11	++	н	+	Н
<u> </u>	-			-		H	+÷	111	11	111	1	11	Ħ	+	Н
			111	+		+	++	111	#	m	111	++	ш	+	Н
	-		111	-	++	+	++	+++	Ħ	Ħ	+++	++	н	+	Н
	-			÷	-	+	+	11:	++	+++	+ ; ;	++	##	Н	Н
	-		-	-	-	+	++	111	÷	-	+ 11	++	++	+	Н
			-	-	+	+	+	111	+	1 . 1	+::	++	+++	+	Н
-11	1/4			-	-	-	+	-	+		+	++	+	+	H
	9	Fleweling Wigton SE	-	1	11	1	+	-	-	11	1	11	11	11	H
14			-	-		-	+	111	+		1	1 .	-	+	Н
13			-	1	1 1	-	1	11	1	- 1	1.	1	1	4	Н
11			-	1	-	-	1		1	-	-	11	111	11	4
17		Jet to 21'		1	-	-!	1	-	1	1 - 1	1	1 :	1 1	Щ	4
18			-	1	1	_	1		1	1	1	1	-	11	Ц
19				1	1		1	1.	1	111	1	11	-	Щ	Ц
10			1	1	1	1	1	11		- 11		11		11	_
u	+		1	1	1 '	1		1:	1	11		11	11	1	
-11	10	Herme fallen ingraperia, income	in with	1	•	11	1		1			1 .	1 1		
11	ar	3113)	1	1 .	1	1	P		11	1		- 1	1	
1.	35		1 1	1	1.	11	1.	+ 1		0	111	11			3
15	45		1	1	1	1		9.3	L	-:1	111	9	111		
14	52	(a) hilmin	1		1	1	1	11		11		11	0	1	
u	16		3	:		1	1	8 1	1	11	1.1	0	1 1		
11	41.	60 bl/min	1	1	4	- 1	T	111	11	1	1		111		П
**	49	22 of "eved to 25 on 5 and	2514	de		ber	L	-		1 1	1				
20	23	21.15		1		1	TG	1	1	11	1 1	1	11		1
31	60		1 1	T	1	1	I	. 0	h	. 1	11.	11	11	11	T,
31	69	22.45	1		1 .	-			10	1	1	11		11	
**	66		1 -	1	. 1		1	1 ; 1	B	0	1	11	11	1	1
34	74	HARRES ERLEUM (Stomes)	1 1	11	1 1	1,	1	1 6 5	1	0	11.	11	1	1	7
35	60		1 1	1	11	. !	1	11		1 . 1	111	11	III	11	0
	44/4	restrike 10/21/18	1 - 1	1	11	1	1		10	4	Li	11	J. 1	N	7
		7-4-	1 1	T	-	11	11	111		111	III	11	11	11	1
			1	T	1	. 1	TT	11		ITT	TT	11	П	11	1
			,	1	1	11	1	1	Ti	111	111	11	111	T	1
-		The state of the s	CONTROL COMPA	-	-	-	-	-	1	117	1	-	-	++	-

Segrand No Dorn's yes of 1 (204) 30-85's

50:45 . Notes . F.O.O.

Capacity, kips

V Jetting depth

WCC, V76 815, Phose & 0.5% & 0.2% E

VA.C.J.

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST

Copth	Blows	Remarks	o bri		Ecs.st	10	40	4 50	-	
0-1		During presetting, organic	1111	1111	4444	! 	11!!	Ш	44	F
	-	matiet which at 10 had	1111	1111	-11111	++++	1111	###	++	Ļ
	-	20'	111	₩	++++	++++	111	+++	++-	H
4	-		3 1 5 4	1!!!		!	11!!	###	#	L
			-	###	-11111	11111	1	+++	++	H
-	-	Ple sinks 11'8"	-	1111	11111	1111	1	1111	++	H
	-		1 1 1 1	tiii	11111	1111	111	***	++-	۲
•	-		1111	 	11111	1111	111	111	++	H
	-		1311	1111	1111	11111	111	111	++	۲
11			1 - 1	1111	1111	1 111	111	1111	TT	Ī
	İ	1.	100	1111	1111	11.	111		II	Г
13			1 1	111	11 11	1	111	11	Ш	
14			- 1	111		1 1 1 1		1 .	II	
13		Jet to 21'		11.	11 11	1 1 2	1 1	1	11	L
1.6			-	1	1111	1111		1: 1	11	L
.,				-	+++	111	1	1111	44	L
14			-	-	44	-	1	-		-
19	-		-	+	+++	-	111	111	++	۲
	-		-	-	++		++	11	++	H
L		42140	-	0	+++	1111	1	11	++	۲
LI	34		1	1	1111	10			11	r
14	19		- 1	1 - 1	11 11	THE RESIDENCE OF THE PARTY OF T		d	11	Г
11	49		1	1			1 11	10	11	
24	33		1 1		1 1	1 6		11	1 1	
· W	34			1	11	10		11	1.	L
	72	Jet to 24'	1 1	1	11	1 3	11		1	L
	24		-	-			-	-	-	۲
>•	28	2400	+-+			9	-	1	11	H
31	88	7.4 4. 30/	1			111	1.	111	1	H
1)	2	matter in wash friese of	0	1	100	1 1 1	1	111	+	۲
34	- 1	wood I love returned	0	111	100	1111	111	111	1	٢
35	11	10 MAS - 00 40	1:11	b	CO	1 111	111	1	Ti	
	44/0	restrice 10/20/72	1 11	11.	1		111		Ш	1
-			1 .1		111	1 11	1111	Ш	11	L
			1 1		1111	1111	Ш	111	11	L
				111	++++	111	111	Ш	1	L
-	THE PERSON NAMED IN	The state of the s					1111			

Vol II A

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST

TON. 03 01 160 1 2300

		2:05	Access to the second	. le					
•			1111	1111	HIII	Π_{ii}		H	Н
•			++++	 	++++	++++	++++	+++	Н
	-		HH	 	***	Hiil	Hiiii	111	Н
3 1				++++	++++	++++	11111	+++	Н
THE RESERVE THE PERSON NAMED IN		Pile sinks 12"	1111	Hiiii	11111	11:1	11111	1111	Н
2	_	THE SIMES IN	1111	1111	11111	1111	1111	111	П
•			1111	TITI	11111	1111	11	Ш	П
.1			1 11	$\Pi\Pi$	$\Pi\Pi\Pi$		111		П
			1 . 4	1111	1111	1111	11111	111	Ц
11			1	1111	1 11	1111	1111	111	Ц
11	*		. 0	1 1 1	1 1 1	1111	1111	+++	Н
-11	4		•	•	1	1 11	1111	+++	Н
-14	12				111		1	1.1	H
15	25			1	0	1111	1	111	H
.,	30			1		0.11	- 1	711	П
14	51	160 bl/min	1	1			11	0 1	
19 1	53	7	1 - 1		1111	1111	:111	Q	Ц
10	69		1 1	1 1	1 11	1:11	1111	111	Ц
N	17	the driving and jet to		1.0	1	1 1 1 1	111	111	Н
	20	6 18,				1	111	-	Н
- 11	-44				1111	1	0	-	H
11	22		1 - 1	1 1		1 - 11	111.	111	-
34		Ste W/min	1 .	1	1 11	1.1	1.11	1.1	I
u l	51		1 .	1 1	1 1 1	1 : 1	1-11	01	1
28	51	2 40	1 -1		1	1.11	1 .	0 1	1
	85	Get to 2 Y, jet on E side,	1 1	1 1	1 1	3 3 4	-	1	-
20	75	organic matter in wash	1 1	1	100	1 1	1	111	4
21	100		-	-	⊕ -0			+++	H
*	42	Jet to 28' , organic matter.	-		10-		11	111	+
34	27	IN MAN	1 11		0	611	1111	111	1
35	95	3:20	1	11:1	0-0	1111	1111	111	
	55/6	restrice 10/20/72	1-11	1 1	. 11		1111	111	1
			1 11	1::	+ + 1 +	1111	1111	111	Ц
			1	1:1	111.	1111	1111	1111	Н
			-	111	111		1111	++++	Н
				0 /	Andrew Tries Takes Institute on		A CONTRACTOR OF THE PARTY OF TH	250	
Segrence	Mess-1	conto yes			po		2000		
AGT 10		MIN- 94 P. P. Hotes: of 6			estrik	P L.			

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 03 01 160 1 2600

0-1		Remarks						-	116	-			4.
		Pile sink 1'		inn	TI	πŕ	ÎTT	1	TT	πi	11	11	1
	*	THE SINK I	di	iiiii	tt	H	111	iii	TT	TH	11	11	1
	1 3		1011	1111	Ti	111	111	11	11	111	11	11	1
	1		1111	1111	11	111	111	111	TT	111	11	11	1
	1 +	Jet 5 6'6"	1111	1111	++	H	111	111	+	†††	++	++	1
	SIL	UEI BUL		1111	11	111	111	1	11	111	11	++	4
-	15		1111	DI	Ti	H	11	11		111	11	11	1
-	1 17		1111	1111	11	111	HI	111	11	111	11	11	1
	 		1111	HHH	11	111	117	11	11	111	11	11	1
1_			1111	1111	1	11	11	111	TT	111	11	11	1
		Jet to 15'	-	1111	T	11	11	11	11	111	11	Ħ	1
- !!-	1	SEL TO AS		1111	1		11	1 1	11	111	T	11	1
	1	•		1111	1	11	1	- 1	TT	111	Ħ	#	1
19	1		-		†	1	-	. 1	1		1	#	1
15			1	111	1	2.1		1	-			11	W
11	11			0	+	-	-	-	-	-	11	11	1
.,	âs		-		1	0	1	11	-	11	11	11	1
14	22		1	. 1	1	0	· Contraction	1	-	11	11	TT	1
10	24		7. 1	1	1	10	1	- 11	11	11	1	11	1
10	61	The second secon		1 1	6	11		11	11	11	31	T	1
	31			1			b	. 11	-	111	11	11	1
<u> </u>	73		1	1	1		and the second	11	O	1	11	11	W
- 11	12	///		3 - 3	1			- 1		0	11	11	1
14	60			1 - 1 1	1	111	1	1	T		1	11	a۷
25	29		1 1	1 1	1	1 10	11:	. 1	11	1	11	T	1
11	24		1		1	01	1	-11		11	11	11	1
· ·	28	And the second s		1 1	1	0	1	1.1	-	11	11	7	1
2.0	25		1	1	1	0	A CONTRACTOR OF THE PERSON NAMED IN		T	1	11		1
	44	38 6 /m.w. Tet at24"	1 1	-	1		-		0		1	-	7
>•	23	Vetat 29'	1	1	10		1	-			11	T	1
21	43	Jud Jmin		0	to		IT	T	0	11	11	11	1
31	84			1. 1	1	1	1		1	111	II	II	b
1)	117	Jet 4 + 22'	1 1		do	1	1.	1	-	111	11		6
34	1/9	64 6//min	1 11	2414	10	-0	III		11	111	II	T	b
35	61/25"	60 M/mm 10:45		1111	þ-	10	11	1.1	: 1	1	П	II	b
	40/4	restrice 10/20/78	1 - 1 1	1.1		-		11	11	11	11	II	-
			1 11	1:1	1.	1 1		11	II	Ш	II	II	1
				1 . 1	1	1 .			11	Ш	II	Π	1
				111		1		1	11	Ш	II	II	J
			1 .	111		1			11	111	II	П]
Dane -	Meas-11			. /	1	1	30	20	10	21			
Segrence		epta Ti		DC-	-		. K	-					
01 120	N_ 3	D. 15' Nates		. 7	-	r.ke		•					
OL MEST	KOO I	E. B. 4. Die popler of		A 2				*					
		- 00%S		A 2	. 11		~-1				1	,	1

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PRE DRIVING EFFECTS TEST TON. 03 01 160 1 0 100 PILE DRIVING RECORD Pile Tipe Double Fir Vulcau Y-1 19 Oct 18 Dote Hammer 1130-1610 E ... 37 15,000 Time Emputer - Tso . openting sate 60 by Grand at treuch text O Driving Resistance 'bijes Depth Remorts Blows THE SINKS 2.5" 2-1 . Jet h 15'1.5" 7 1111 11 .. 11 13 - Wes IIII 14 . . No Date! taken 14 1. 111 SY MIMIN 10 611 1111 J. H/mw 14 1111 31 11 1111 St. blfories 0 11 101 1. 57 War 15 101 .. 101 60 b/min 12 101 43 61/min 28 .. 56 61/min 13:42 20 21 . 0-0 . 34 33

Di (TDA) 83-33'8' Notes Dietry dapth

WCC, YTC BIS, Phoso II 25% W

1250

PRELOADING , MONOLITH MI

ID No.: 07-01-010

MONOLITH(S) TESTED: M1

TEST TYPE: RELOADING

	Sequence No.	0000	0003	0006	0007	0008
	Date/Time	12/0/18 0000	12/13 0630	12/13 0707	12/13 0907	12/13 0922
	Description of Event	DNITIALI BATION	AXIAL LOAD 25% NO LATERAL	AXIAL LOAD 25% NO LATERAL	AXIAL LOAD 50% NO LATERAL	AXIALLOAD 50% NO LATERAL
	Dial Gages, P(1)	~		V		V
	Optical Horizontal Control, P(1)	/	reflectors only		ref bases only	
DATA	Optical Vertical Control. P(1)	~		/		/
	Tape Extensometer, P(1)	~				
PRIMARY	Tilt Meters, P(1)	1				
PR						
	Timber Pile Inclinometers, S(9)	/				
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	V		/		~
4	Surface Settlement, S(11)					
DATA	Ground Inclinometers, S(12)					
	Sondex, S(12)	V				
DA	Piezometers, S(13)	V				
SECONDARY	Thermo-couples, S(14)	~				~
SEC	Strain Gages, S(10)	/				
	Record No 02	BALANCE				
	Record No 03	BALANCE				

ID No .: 07-01-010

MONOLITH(S) TESTED: M1

TEST TYPE: PRELOADING

	Sequence No.	0012	0016	0030	0035	0042
	Date/Time				12/14 0404	
	Description of Event	AXIAL LOAU 75% NO LATERAL	FULL AXIAL LOAD NO LATEFAL	FULL AXIAL LATERAL 25%	FULL AXIAL LATERAL 50%	FUL AXIAL LATERAL 75 %
	Dial Gages, P(1)	/		/	/	/
4	Optical Horizontal Control, P(1)	ref becausemly	ret heams enly	ret beams only	ret bases only	ref beaus only
ATA	Optical Vertical P(1) Control,	/	~	~	~	~
YD	Tape Extensometer, P(1)		purtial	V	~	✓
PRIMARY	Tilt Meters, P(1)		~	~	partial	✓
	Timber Pile Inclinometers, S(9)		Na11827 mly		✓	
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)		/		✓	
4	Surface Settlement, S(11)		✓			
DAT	Ground Inclinometers, S(12)		V			
A	Sondex, S(12)		✓			
DA	Piezometers, S(13)	/	V		V	V
SECONDARY	Thermo-couples, S(14)		/	/	~	V
SEC	Strain Gages, S(10)	~	~	V	V	V
	Record No 02	5	6	7	ε	9
	Record No 03	5	6	7	8	,

ID No.: 07-01MONOLITH(S) TESTED: M1

DE MI TEST TYPE: PRELOADING

	Sequence No.	0050	0058	0060	0063	0065
	Date/Time	12/14 1620	12/14 2004	12/14 2034	12/14 2050	12/14 2107
	Description of Event	FUL AXIAL DIATERAI LOADS	V = FULL H = H1/10 N = 1	V=FULL=W H=H1+RUL N=Z	V= VI H= H1/10 N= Z	V= V1 H = H1 N= 3
	Dial Gages, P(1)					
•	Optical Horizontal Control, P(1)	✓	partial	partial	partial	partial
DAT	Control P(1) Optical Vertical Control P(1)	V				
	Tape Extensometer, P(1)	✓				
RIMARY	Tilt Meters, P(1)	✓				
٩					8	
	Timber Pile Inclinometers, S(9)	V				
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)					
4	Surface Settlement, S(11)					
DATA	Ground Inclinometers, S(12)					
A	Sondex, S(12)	V				
DA	Piezometers, S(13)		8			
SECONDA	Thermo-couples, S(14)	V				
SEC	Strain Gages, S(10)	✓				
	Record No 02	10				
	Record No 03	10				

ID No.: 07: 01MONOLITH(S) TESTED: M1

TEST TYPE: PRELOADING

	Sequence No.	007	2	00	774	00	78	00	79	00	180
	Date/Time	12/14	2330	12/15	0012	12/15	æ	12/15	0230	12/15	050
	Description of Event	V = VI H = HI N = 3	110	> H >		V= H= N:	4./10	H:	Vi H	H=	VI H./10 = 5
	Dial Gages, P(1)										
4	Optical Horizontal Control, P(1)	parti	al	pas	tial	pu	tial	pur	tial	PA	tial
DATA	Optical Vertical P(1)										
	Tape Extensometer, P(1)										
PRIMARY	Tilt Meters, P(1)										
PR											
	Timber Pile										
	Timber Pile Slopes, S(9)										
	Tell Tales, S(10)										
•	Surface Settlement, S(11)										
DATA	Ground Inclinometers, S(12)										
A	Sondex, S(12)										
DA	Piezometers, S(13)										
SECONDARY	Thermo-couples, S(14)							,	/		
SEC	Strain Gages, S(10)										
	Record No 02										
	Record No 03										

Note: / = Complete set of readings taken

ID No.: 07-01MONOLITH(S) TESTED: M1

TEST TYPE: PRELOADING

	Sequence No.	0083	0088	0097	0101	0106
	Date/Time	12/15 0335	12/15 0416	12/15 0627	12/15 0825	12/15 0926
	Description of Event	V= V1 H= H1 N= 6	V= Vi H= Hi N= 7	V= VI H= H I N= 8	7= 8 H= H'\0 ∧= ∧'	N= V1 H= H1
	Dial Gages, P(1)		/			
•	Optical Horizontal Control, P(1)	partial	ref bases only	partial	partial	partial
DATA	Optical Vertical P(1) Control		/			
	Tape Extensometer, P(1)		V			
RIMARY	Tilt Meters, P(1)		~			
٩	Timber Pile					
	Inclinometers, S(9)					
	Timber Pile Slopes, S(9)			7		
	Tell Tales, S(10)		/			
4	Surface Settlement, S(11)					
DAT	Ground Inclinometers, S(12)					
A	Sondex, S(12)					
DA	Piezometers, S(13)		/			
SECONDARY	Thermo-couples, S(14)		V			
SEC	Strain Gages, S(10)		✓			
	Record No 02		11			
	Record No 03		11			

Prace I to A

ID No.: 07-01-

MONOLITHIS) TESTED: M1 TEST TYPE: PELOADING

	Sequence No.	0110	0114	0121	0123	0128
	Date/Time	12/15 1006	12/15 1200	12/15 1621	12/15 2020	12/15 204
	Description of Event	V= V1 H= H1/10 N= 9	N= 10 N= 10	N= 10	N=11 H=H1	N= 11 N= N'\10
	Dial Gages, P(1)					
DATA	Optical Horizontal Control, P(1) Optical Vertical Control, P(1)	portial	V	partial	partial	partial
	Control, P(1) Tape Extensometer, P(1)	V				
PRIMARY	Tilt Meters, P(1)	Ž	~			
	Timber Pile Inclinometers, S(9)	4	_	Na 1 & 22 only		
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	/				
*	Surface Settlement, S(11)					
DATA	Ground Inclinometers, S(12)		V,			
A	Sondex, S(12)		V			
DA	Piezometers, S(13)	V	V			
SECONDARY	Thermo-couples, S(14)					
SEC	Strain Gages, S(10)			~		
	Record No 02			BALANCE		2
	Record No 03			MALANCE		

ID No.: 07-01-

MONOLITH(S) TESTED: M1

TEST TYPE: PRELOADING

	Sequence No.	01	31	01	35	013	37	01	39	01	41
	Date/Time	12/15	2105	12/15	2140	12/15	2205	12/15	2217	12/15	2237
	Description of Event	>	H	> H Z	H.	N=	4./10	V= H= N=		> H 2 =	H./10
	Dial Gages, P(1)									,	/
DATA	Optical Horizontal Control, P(1) Optical Vertical Control, P(1)	par	tial	PALI	tial	par	tial	pe	rtial		7
	Tape Extensometer, P(1)									pur	
PRIMARY	Tilt Meters, P(1)									[~·	
PRI											
	Timber Pile Inclinometers, S(9)										
	Timber Pile Slopes, S(9)										
	Tell Tales, S(10)										
4	Surface Settlement, S(11)										
DATA	Ground Inclinometers, S(12)										
	Sondex, S(12)										
DA	Piezometers, S(13)										
SECONDARY	Thermo-couples, S(14)										
SEC	Strain Gages, S(10)										
	Record No 02				++		* •				
	Record No 03										

MONOLITH(S) TESTED: M1

TEST TYPE: HELOALING

	Sequence No.	0147	0149	0158	0168	0175
	Date/Time	12/16 0300	12/16 0322	12/16 0451	12/16	12/16
	Description of Event	V = V1 H = H1 N = 16	V = VI H = HI/10 N = 16	N=20	V= V1 H= H1 N= 24	V= VI H= H1 N= 27
	Dial Gages, P(1)			~		
	Optical Horizontal Control, P(1)	partial	partial	pertial	partial	pertial
DATA	Optical Vertical Control, P(1)					
	Tape Extensometer, P(1)					
PRIMARY	Tilt Meters, P(1)					
PR						-
	Timber Pile Inclinometers, S(9)					
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)					
4	Surface Settlement, S(11)					
DATA	Ground Inclinometers, S(12)					
	Sondex, S(12)					
PA	Piezometers, S(13)			~		
SECONDARY	Thermo-couples, S(14)			/		
SEC	Strain Gages, S(10)			/		
	Record No 02					
	Record No 03			4:		

YM265 East To WILLA

MONOLITH(S) TESTED: M1

TEST TYPE: PRELOADING

	Sequence No.	0177	0187	0208	0211	
	Date/Time	12/16 1125	12/16 1300	12/16 1855	12/6 2335	
	Description of Event	V= Vi H= H1 N= 28	V=V1 H=H1 N=30	V = Vi H = H i N = 40	V= 0 H= 0	
	Dial Gages, P(1)					
4	Optical Horizontal Control, P(1)	partial	/			
DATA	Optical Vertical Control, P(1)		1	1	1	
	Tape Extensometer, P(1)			1	1	
PRIMARY	Tilt Meters, P(1)		V	~		
PR						
	Timber Pile Inclinometers, S(9)			V NO. 25 11		
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)					
4	Surface Settlement, S(11)					
DAT	Ground Inclinometers, S(12)					
	Sondex, S(12)					
DA	Piezometers, S(13)			/		
SECONDARY	Thermo-couples, S(14)		V	1		
SEC	Strain Gages, S(10)		~	~	/	
	Record No 02					
	Record No 03		5	6	8	

Note: / = Complete set of readings taken

PILE DRIVING MOUDERE MI

ID No.: 09-01MONOLITH(S) TESTED: M1

TEST TYPE: POET

	Sequence No.	0000	0020	0028	0205	0212
	Date/Time	12/24/78 1030	12/11 2250	12/22 0800	12/22 1800	12/22 2300
	Description of Event	INITIALIZATION	FULL AXIAL AND LATERAL LOADS	AFTER STABLIZATION FULL LOADS	PILE NO. 2 ~50ft PENETRATION	PILENO. 2 ~ 100 ft FUL PRETRATION
	Dial Gages, P(1)	/	~	V	V	V
4	Optical Horizontal Control, P(1)	/	V	V	~	~
ATA	Optical Vertical Control, P(1)	V	V	~	V	V
RYD	Tape Extensometer, P(1)	V	V		V	~
PRIMAR	Tilt Meters, P(1)	~	/			
	Timber Pile Inclinometers, S(9)	✓ ·	V	1		
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	<u> </u>				
ATA	Surface Settlement, S(11) Ground Inclinometers, S(12)	~	PD3D1 anly			
YD	Sondex, S(12)	~				
DAR	Piezometers, S(13)	V	V	~	~	V
SECONDARY	Thermo-couples, S(14)	V	7	7	1	V
SEC	Strain Gages, S(10)	BALANCE		✓		/
	Record No 02					4:
	Record No 03					

Note: / = Complete set of readings taken

Francis 16 2 F

ID No.: 09-01MONOLITH(S) TESTED: M1

TEST TYPE: PDET

	Sequence No.	0215	0300	0307	0312	0400
	Date/Time	१५/२६ २२००	व्यंत ठाऽ०	1427 1338	12/27 1652	12/28 0730
	Description of Event	No LOADS	FULL AXIAL AID LATERAL LOADS ON	PILE NO. 3 ~ 50ft RENETRATION	PILE NA. 3 ~100 ft FLLIMETATION	HIE NO.4
	Dial Gages, P(1)	/	V	/	/	V.
ATA	Optical Horizontal Control, P(1) Optical Vertical Control, P(1)		Y	V	/	ref beaus only
0	Control, P(1) Tape Extensometer, P(1)	A CONTRACTOR OF THE CONTRACTOR	Y .	<u> </u>	V	V
RIMARY	Tilt Meters, P(1)		✓ ✓	~	~	~
PRI						
	Timber Pile Inclinometers, S(9)		~		~	
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)		/			
4	Surface Settlement, S(11)					
DATA	Ground Inclinometers, S(12)		4		PD3DI mly	
¥	Sondex, S(12)		~			
DA	Piezometers, S(13)		V	~	~	1
SECONDAR	Thermo-couples, S(14)		V	~	V	/
SEC	Strain Gages, S(10)				~	1
	Record No. – 02				4	5
	Record No 03					

Note: / = Complete set of readings taken

ID No.: 09 - 01 -

MONOLITH(S) TESTED: M1 TEST TYPE: PDET

	Sequence No.	0404	0406	0503	0600	0603
	Date/Time	12/28 1050	12/28 1435	12/28 1705	12/29 0750	12/29 1330
	Description of Event	FILE NO4 ~50 ft MLF FEMETRATION	PILE NO. 4 ~ 100 ft. PULL FRETRATION	PILE NO.5 ~50ft HALFPOLETEMEN	PILENO. 6 START	PILE NO. 6 ~ SOFT HUE TRETINION
	Dial Gages, P(1)	V	~	~	✓	~
4	Optical Horizontal Control, P(1)	V	~	✓	V	ref beams mly
AT	Optical Vertical Control, P(1)	/	V	V	~	ret banks only
Y D	Tape Extensometer, P(1)	V		V		
PRIMARY	Tilt Meters, P(1)					
	Timber Pile Inclinometers, S(9)					
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)			V		
4	Surface Settlement, S(11)					
DAT	Ground Inclinometers, \$(12)					
RY	Sondex, S(12)					
DA	Piezometers, S(13)	✓	✓	V	V	V
SECONDARY	Thermo-couples, S(14)	/	✓		~	V.
SEC	Strain Gages, S(10)			/		V
	Record No 02			6		7
	Record No 03					

Harry Vol. III. F

MONOLITH(S) TESTED: M1

TEST TYPE: PDET

	Sequence No.	0606	0700	0703	0704	0709
	Date/Time	1429 1730	12/20 0800	12/30 1330	1/2/19 0800	1/2 2340
	Description of Event	PILE NO. 6 ~ 100ft FUL TENERATION	PILE NO. 7 SYART	PILE NO.7 ~SOft MAFFEMENTATION	PILE NO. 7 ^ SOft HALF PENETRATION	PILE NO.9 ~100ft FULL POLEBATION
	Dial Gages, P(1)	V	V	/		
4	Optical Horizontal Control, P(1)	✓	/	ref beams only	~	
A	Optical Vertical P(1)	V	/	ref become only	/	✓
Y D	Tape Extensometer, P(1)		V	ref beams andy	monolithouly	/
PRIMARY	Tilt Meters, P(1)		_	/		V
	Timber Pile		/ except			
	Inclinometers, S(9) Timber Pile Slopes, S(9)		V 1625'11			
	Tell Tales, S(10)					
4	Surface Settlement, S(11)					
DAT	Ground Inclinometers, S(12)		V			
A	Sondex, S(12)					
PA	Piezometers, S(13)	✓	✓ :	/	/	1
SECONDA	Thermo-couples, S(14)	V	V	~	partia l	V
SEC	Strain Gages, S(10)	1		✓	~	~
	Record No 02	8		9	10	11
	Record No 03					

Note: / = Complete set of readings taken

470895 Phacett 11 TLA

ID No.: 09-01MONOLITH(S) TESTED: M1

TEST TYPE: PUET

	Sequence No.	0803	0809	0903	0907	1000
	Date/Time	1/3 0730	1/ 5/79 1625	1/3 2110	1/4 0130	1/4 0730
	Description of Event	PILE NO.B ~50ft HILF PENETRATION	PILE NO. B ~NOOST FUL TENETRATION	PILE NO.9 ~50ft HAU RENETBATION	PILE NO. 9 ~100ft PLL PENETRATION	PLENO. 10 START
	Dial Gages, P(1)	/			~	
4	Optical Horizontal Control, P(1)	ref beams only	V	\	/	/
4	Optical Vertical Control, P(1)	/	V		V	~
V D	Tape Extensometer, P(1)	V	V		Y	
PRIMARY	Tilt Meters, P(1)	~			~	
	Timber Pile Inclinometers, S(9)		J except		~	
	Timber Pile Slopes, S(9)	,				
	Tell Tales, S(10)	✓				
DATA	Surface Settlement, S(11) Ground Inclinometers, S(12)		✓ COPT		PDSDI only	
	Sondex, S(12)					
SECONDARY	Piezometers, S(13)	1	/		~	~
S	Thermo-couples, S(14)	V	~		V	V
SEC	Strain Gages, S(10)		~			
	Record No 02		12			
	Record No 03		6 !			

Process 6 III A

ID	No.:	09-0	1 -	

MONOLITH(S) TESTED: M1

TEST TYPE: PDET

	Sequence No.	100	04	100	98	1.1	00	11	04	11	04
	Date/Time	1/4	1100	1/4	1700	1/5	0010	1/5	0305		0745
	Description of Event	PILE N		~10	NO. 10 Ofl ETRATION		NO.11	-4	NO. 11 Sfl TRATION	~	ENO. II ISPL PATION
	Dial Gages, P(1)				/						
4	Optical Horizontal Control, P(1)	ref beam	souly	,	~		/		✓		
DATA	Optical Vertical Control, P(1)	1		,	/		V		/		
Y 0	Tape Extensometer, P(1)				V				/		/
PRIMARY	Tilt Meters, P(1)		/								
	Timber Pile										
	Inclinometers, S(9)			V .	except 02811						
	Timber Pile Slopes, S(9)										
	Tell Tales, S(10)	\ \v	/								
4	Surface Settlement, S(11)				/						
DATA	Ground Inclinometers, S(12)			,	,						
	Sondex, S(12)			,	/						
DA	Piezometers, S(13)				/						
SECONDARY	Thermo-couples, S(14)	V	/		/						
SEC	Strain Gages, S(10)	,	/	,	/						
	Record No 02			1	3						
	Record No 03	7		0	٥						

Phoeny 6 11

ID No.: 09-01-

MONOLITH(S) TESTED: M1

TEST TYPE: POET

	Sequence No.	110	05	-11	10	12	05	12	208	13	300
	Date/Time	1/5	1157	1/5	1645	1/5	2309	1/6	0300	1/6	0700
	Description of Event	PILE N ~ 52 HUF RNE		~	NO. 11 95ft NETRATION	^ 5	ENO, IZ 51 ft VETRATION	~	NO.12 94 ft NOTION	67	NO.13 ART
	Dial Gages, P(1)				/					•	/
•	Optical Horizontal Control, P(1)	4			,		/		/	,	/
DATA	Optical Vertical Control, P(1)	_			1		/		/	,	/
	Tape Extensometer, P(1)		V		/		/		/		
PRIMARY	Tilt Meters, P(1)		/	_	/	V	/				
	Timber Pile Inclinometers, S(9)			✓.	except b. 2 s 11	√ A	0.24 II				
	Timber Pile Slopes, S(9)	-									
	Tell Tales, S(10)	-			,		,		,	-	_
DATA	Surface Settlement, S(11) Ground Inclinometers, S(12)				✓ ✓	POSDI					/
ARY	Sondex, S(12)		,		,						
SECONDARY	Piezometers, S(13)	~		-	/	-	_		<u> </u>		/
00	Thermo-couples, S(14)								,	-	_
SE	Strain Gages, S(10)			-	/	-	/		<u> </u>		/
	Record No 02			1	4	1	5	-	6		7
	Record No 03										3

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ID No.: 09-01-

MONOLITH(S) TESTED: M1

TEST TYPE: PDET

	Sequence No.	1302	1305	1308	1310	1315
	Date/Time	1/6 1740	1/6 2030	1/7 00100	1/8 0200	1/8 0700
	Description of Event	PILE NO. 13 ^ ZOFL PRETRATION POT RESET	PILE NO. 13 ~ 51ft HALF REMERTATION	PLE NO. 13 ~ 93ft TULL REJETRATION	PILENDIS ~ 93ft PLL TSETEMEN	BERO AKIAL MD LATERAL LOADS
	Dial Gages, P(1)	V			/	
•	Optical Horizontal Control, P(1)	✓	~	✓	V	
DATA	Optical Vertical P(1)	~	V	/	✓	
	Tape Extensometer, P(1)	V	V			
PRIMARY	Tilt Meters, P(1)		✓	~		V
	Timber Pile Inclinometers, S(9) Timber Pile Slopes, S(9)		√ except √ Mizs II	V Waz & 11		
	Tell Tales, S(10)			-		
•	Surface Settlement, S(11)	~	V			
DAT	Ground Inclinameters, S(12)		POSDI mly		POSDImiy	
A	Sondex, S(12)					
P	Piezameters, S(13)		V	_ <		
SECONDARY	Thermo-couples, S(14)		~	>		/
SE	Strain Gages, S(10)		~	~		/
	Record No 02			18		19
	Record No 03		117	12		13

Note: / = Complete set of readings taken

L.S SUMMARY LOG OF DATA ACQUIRED DUE HE LATERAL LOAD TESTING MONO THE ME

MONOLITH(S) TESTED: M1

TEST TYPE: LAT LOAD TEST

	Sequence No.	000	0	0000	0	100	00	200	00	03		
	Date/Time	1/8/19	1200	1/9 1300	1/9	1715	1/9	2200	1/10	0030		
	Description of Event			INITIALIZATION	V=3	860t 0		400t	V= H=	360t 0		
	Dial Gages, P(1)	~		~		/		/	•			
4	Optical Horizontal Control, P(1)			~		~		/	~	/		
DATA	Optical Vertical Control, P(1)	✓		~		V		/	~	/		
	Tape Extensometer, P(1)	✓		✓				V				
PRIMARY	Tilt Meters, P(1)			~		<i>\</i>		/				
	Timber Pile Inclinometers, S(9)	V NOZ	ept 2.11									
	Timber Pile Slopes, S(9)											
	Tell Tales, S(10)			~	/		V					
4	Surface Settlement, S(11)											
DAT,	Ground Inclinameters, S(12)	/										
A	Sondex, S(12)											
DA	Piezometers, S(13)	~		~		/	/					
SECONDARY	Thermo-couples, S(14)	V		V		~		V				
SE	Strain Gages, S(10)			/					,	/		
	Record No 02			BALANCE							5	
	Record No 03			BALANCE						15		

MONOLITH(S) TESTED: M1

TEST TYPE: LAT LOAD TEST

	Sequence No.	0011	0021	0028	0074	0079
	Date/Time	1/10 0520	1/10 1230	1/10 2000	1/11 0700	1/11 1125
	Description of Event	V = 360t H = 72 t	V=360t H=108t	V=360t H=144t	V=360t H≅168t	V=0 H=0
	Dial Gages, P(1)	V .	✓	/	7	
4	Optical Horizontal Control, P(1)	/	✓	/	monolith only	mondith only
ATA	Optical Vertical Control, P(1)	/	1	/	/	
RYD	Tape Extensometer, P(1)	/	1	~		
PRIMAR	Tilt Meters, P(1)	1	Y	7	/	
	Timber Pile Inclinometers, S(9)		J except	J except	Naizonly	
	Timber Pile Slopes, S(9)			100		
	Tell Tales, S(10)				~	
TA	Surface Settlement, S(11)					
DAT	Ground Inclinameters, S(12)		1		/	
2000	Sondex, S(12)	,				
OA	Piezometers, S(13)	1		✓		
SECONDARY	Thermo-couples, S(14)	✓	/	/	~	
SEC	Strain Gages, S(10)	J	V	1	✓	✓
	Record No 02	6	7	8	11	12
	Record No 03	6	7	3	14	15

Y7C-825
Phase &; Vol II A

L.G COMPLETE DRIVING RECORDS OF PROTOTYPE PILES
DRIVEN WITH IMPACT HAMMER, MONOLITH MI

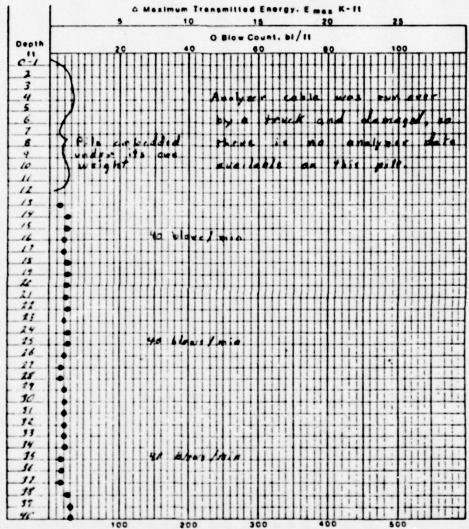
The driving records are presented in chronological order of driving for prototype piles No. 1 through 13, driven with a VULCAN 010 hammer.

I.D. N. 09 01 180 1 000 WOODWARD-CLYBE CONSULTANTS LOCES AND DAM No. 26 PILE DRIVING MEASUREMENTS 11:05 200 H M1 FINISH 12:03 01
HIYX73

A Maximum Tomomitted Energy, Emas K-FF 0/05 EL 400 390 380 WLL, YTCOES, Phose II ; WOL II A

I.O. No. 09 01 180 7 0 00 WOODWARD-CLYDE CONSULTANTS LOCES AND DAM No. 26 PILE DRIVING EFFECTS TOST PILE DRIVING MEASUREMENTS PILE HO. OL Driving Resistance , W/ 51 47 350 340 310 WCC, YTOSE . Phose II 5 VOL II A

P._ L 01 3 WOODWARD-CLYDE CONSULTANTS I.D. No. 09 01 1 0200 LOCKS AND DAM NO. 26 Date 12/22/78 PILE DRIVING EFFECTS TEST Operator MAILLA Time Secuence No. PILE DRIVING MEASUREMENTS First _16:40 9201 PILE NO. 22 Finish 21:56 ISOFT from MI A Maximum Transmitted Energy. E max K-ft

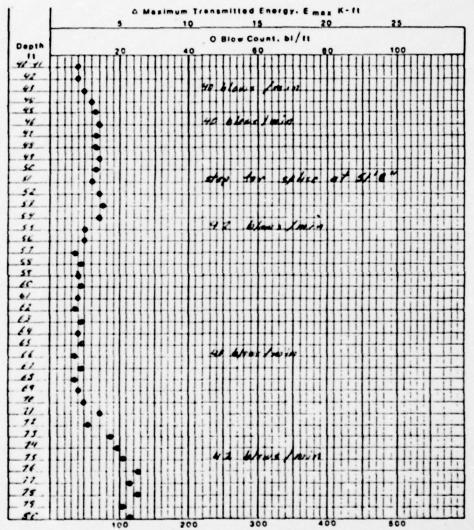


WCC. Y7C825. Phose TY SVOL TA

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST 1.D. No. 09 0/ 180 / 0200 Date /2/22/28 Operator M/314

PILE DRIVING MEASUREMENTS
PILE NO. ________

Time Sequence No.



WGC. Y7C825. Phase IV & VOL III A

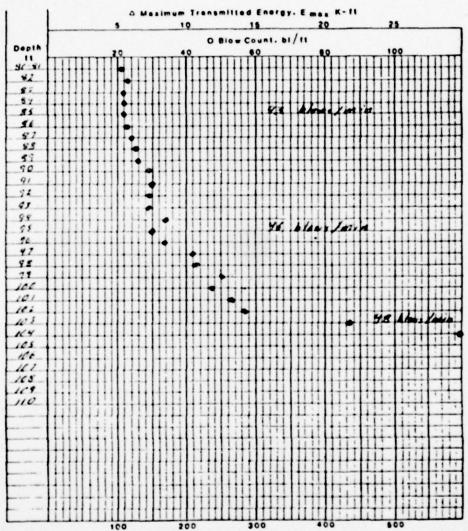
WOODWARD-GLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST

1.D. No. 09 01 180 1 0200 Doto 12/22/20

Operator_IH_

PILE DRIVING MEASUREMENTS
PILE NO. _02__

Time Sequence No.
First _____



WCG. Y7C625. Phase IT; WL TA

I.O. N. 09 01 180 3-000 WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM Ho. 16 PILE DRIVING EFFECTS TOST PILE DRIVING MEASUREMENTS PILE No. 03 125 4 M1 HPHX73 EL 400 Special-Soren: Maximum Driving some , Fman , Kips D . wee, yrees . Anse W ; bl I A

WOODWARD-CLYDE CONSULTANTS I.b. No. 09 01 180 7 0000 LOCES AND DAM No. 16 Date 27 DEC 78 PILE DRIVING EFFECTS TEST operator JEL PILE DRIVING MEASUREMENTS Sequence No Time PILE HO. 03 First 0303 Finish 03/2 o Driving Resistance , W/ st 0 START EBIO3-STOP@13:06 SAMTEISIE 51 55 70013:21 THETEIS:H WELD ON A ZND Section Spre 15:23-STACTO IT IT

briving some , Fman , Kips [

WCL; YTOSE; THENE I JUST UA

I.b. N. 09 01 180 T 0000 WOODWARD-CLYDE CONSULTANTS . LOCES AND DAM Ho. 26 Date 27 Dec 78 PILE DRIVING EFFECTS TEST operator IIL PILE DRIVING MEASUREMENTS Time Sequence No PILE HO. 03 SART 01546-80-8 26 29 SEP PIS: SJ . Store Kill SPETEK:34 101 102 105 SOPE ILIES 106 D Masimum Driving some , Fran , Kips WELL, YTESTS; PLOOF II ; VOL II A

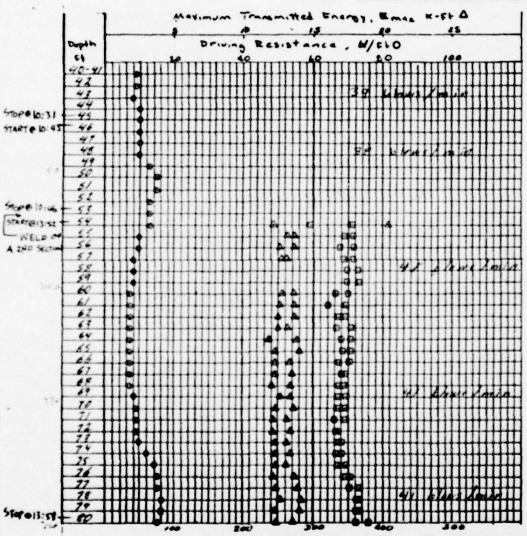
HP14×73 125 # M1 WOODWARD-CLYDE CONSULTANTS I.D. N. 09 01 180 8-000 LOCES AND DAM No. 16 Date 28 DEC 78 PILE DRIVING EFFECTS TEST operator JEL PILE DRIVING MEASUREMENTS NOTE: Emax & Frank are not plotted Finish 19 was not working during this recipion. Hed Energy. 09:22 Depth EL. 400 13 MART O MEZ 16 17 more of 15 STACT 804:51-STOP 04:53 Ser e bill Driving some , Fman , Kips wee, yrests, mase III; VOL IIA

WOODWARD-CLYDE CONSULTANTS LOCES AND DAM NO. 26 PILE DRIVING EFFECTS TEST

PILE DRIVING MEASUREMENTS

T.D. No. 09 01 180 TO 0 00 0 Date 28 DEC 79 Operator JSL

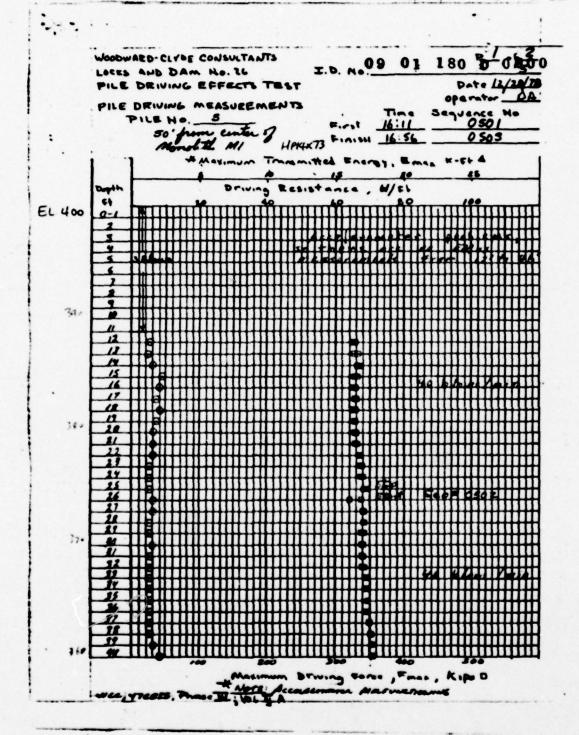
Time Sequence No E. 1 09:22 0401
Finish 14:31 0406



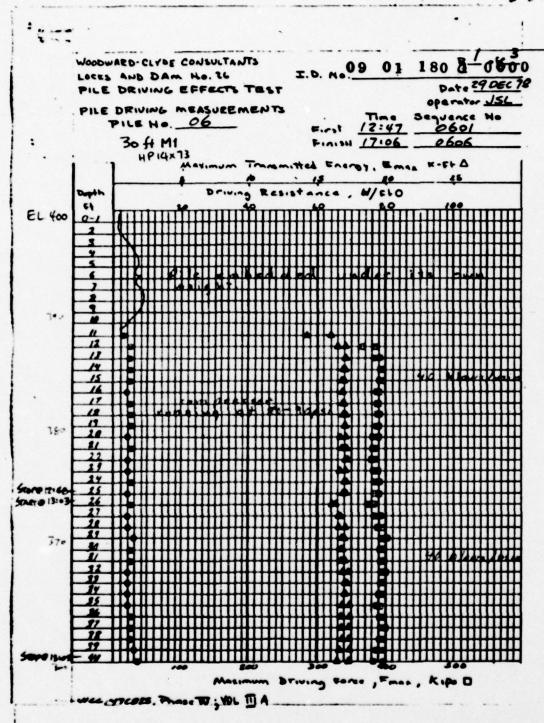
Maximum Briving torse , Fmas , Kipe D

WELL, YTESB. Phase III; YOU I A

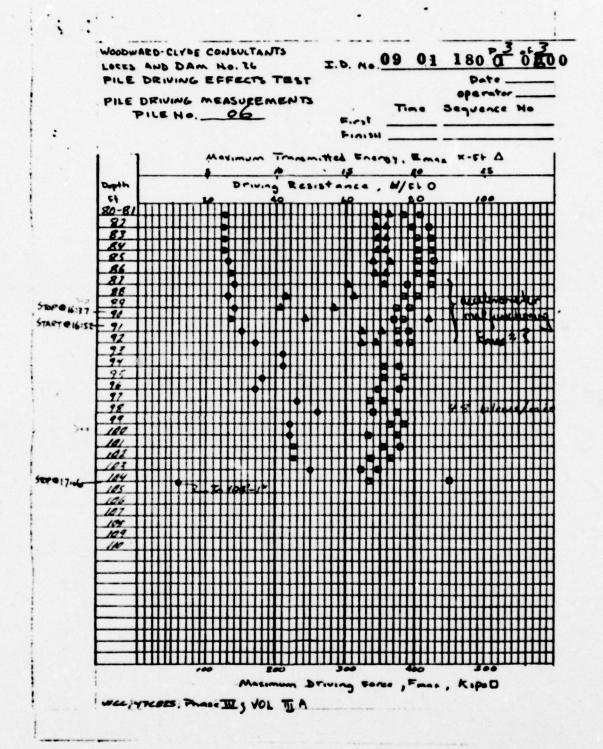
I.b. M. 09 01 180 5 0 00 WOODWARD-CLYDE CONSULTANTS LOCES AND DAM No. 26 Pate 28 DEC 78 PILE DRIVING EFFECTS TEST operator JEL PILE HO OF Sequence No Fig. 14:31 0006 a Maximum Transmitted Energy, Emas X-Et Depth 43 START HIS +80-8 24 86 88 90 9/ 95 16 98 101 101 105 Stor @ 14:31 106 107 W 106-6 105 109 110 D Masimum Driving some , Fman , Kips LOCK, YTCOES, PROSTE; YOL TIA

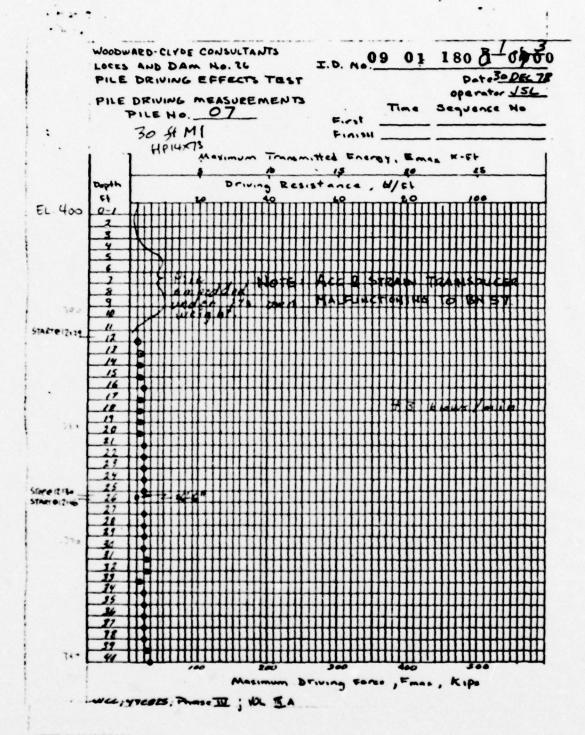


WOODWARD-CLYDE CONSULTANTS I.D. No. 09 01 180 LOCKS AND DAM No. 26 PILE DRIVING EFFECTS TEST PILE DRIVING MEASUREMENTS PULL TICORS, Proce II ; VOL I

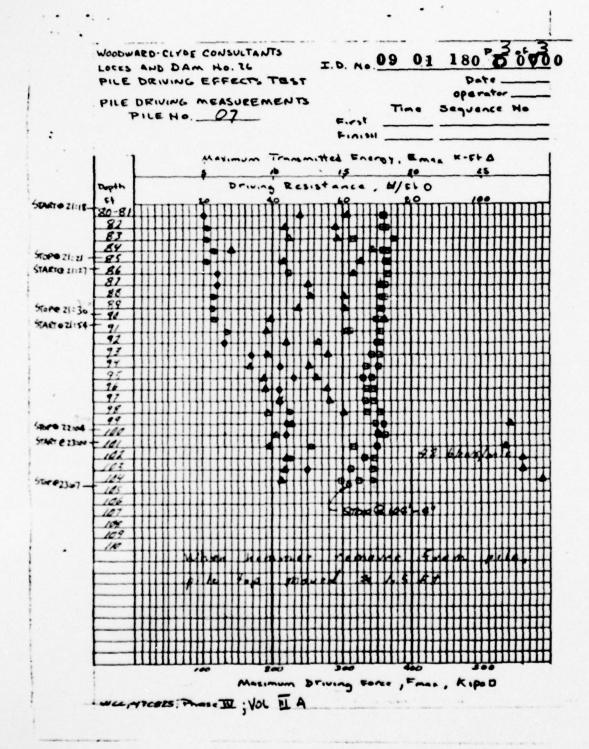


I.O. No. 09 01 180 0 0800 WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM No. 26 PILE DRIVING EFFECTS TEST PILE DRIVING MEASUREMENTS Sequence No PILE No. 06 Resistance , M/EL 64 41 44 45 46 47 48 49 50 Sep 013:18 Spenousog. \$\$ \$6 \$7 25 80 A 22 C 54 44 STATE 16:13 1217 117 117 117 briving tome , Fore , Kips WELL TROPS . Phase TO | Vote I A





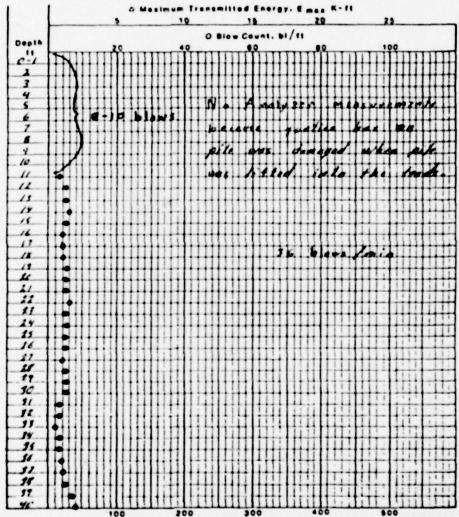
I.b. No. 09 01 180 7 0700 WOODWARD-CLYDE CONSULTANTS LOCES AND DAM No. 26 PILE DRIVING EFFECTS TOST operator _ PILE DRIVING MEASUREMENTS Time Sequence No PILE HO. 07 FINISH _ Maximum Transmitted Energy, Emas K-F+D 43 46 51 STOPOLT 13 58 59 60 61 61 61 64 65 5041 6 20:44 Maximum Driving some , Fman , Kips D - WCL. YTCOB Phase TO ; VOL IA



WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST 1.D. No. 09 01 180 0 0800 Date 1/2/79 Operator DMM/TH

PILE DRIVING MEASUREMENTS
PILE NO. ______

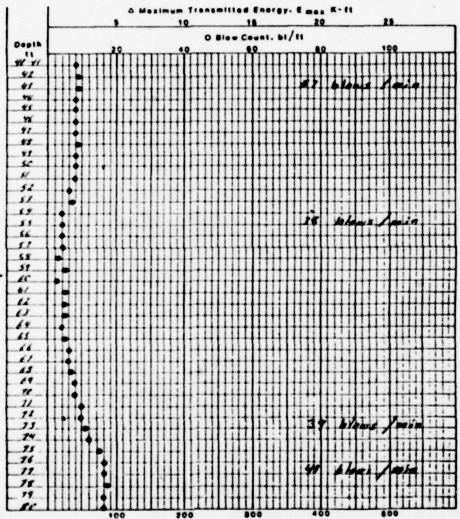
First Sequence No.



WCC. V7C825. Phose IT ; Vol E A

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST 1.0. No. 02 01 180 0 084 Doto 1/1/29 Operator Ark

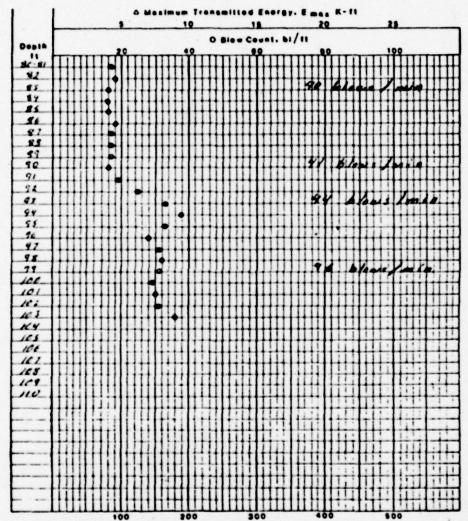
PILE DRIVING MEASUREMENTS PILE NO. 08_ Time Bequence No.



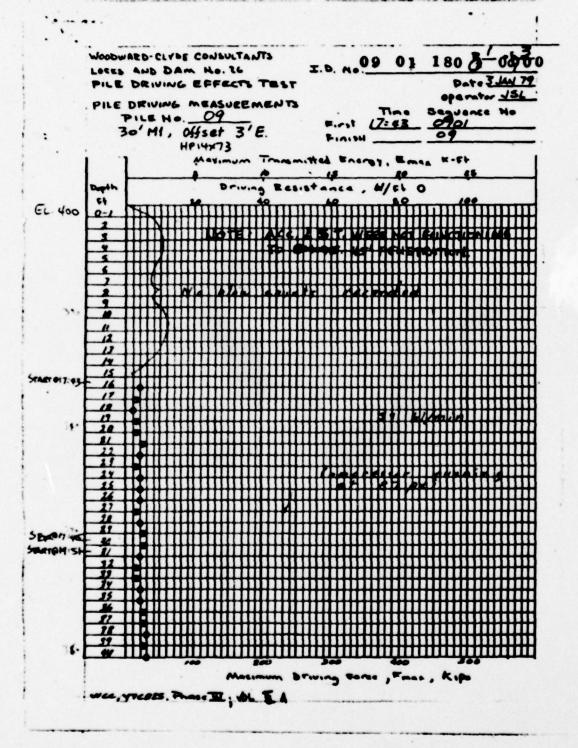
WCC. VICE25. Phase TI ; WL EA

WOODWARD-GLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST 1.0. No. 09 01 180 0 0800 Dotto 118/22 Operator Ace

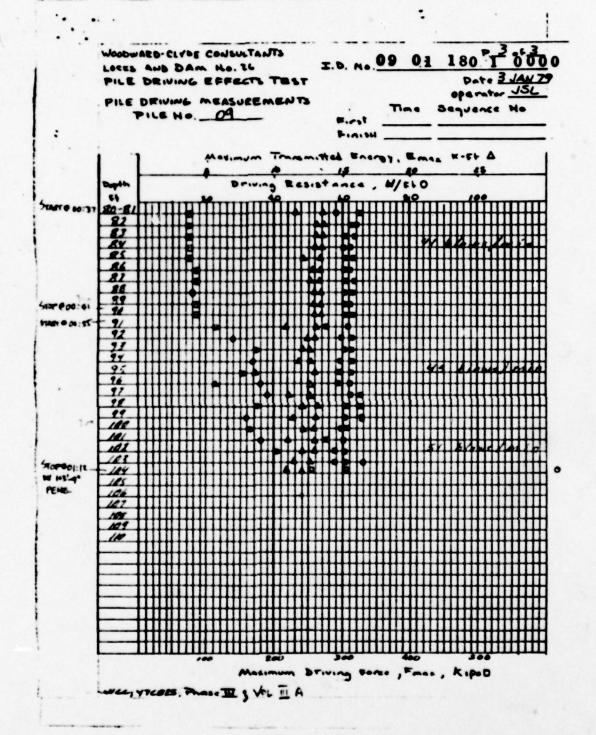
PILE DRIVING MEASUREMENTS PILE NO. _______ Time Sequence No.



WCC. YTCOSS. Phose IT SUL TA

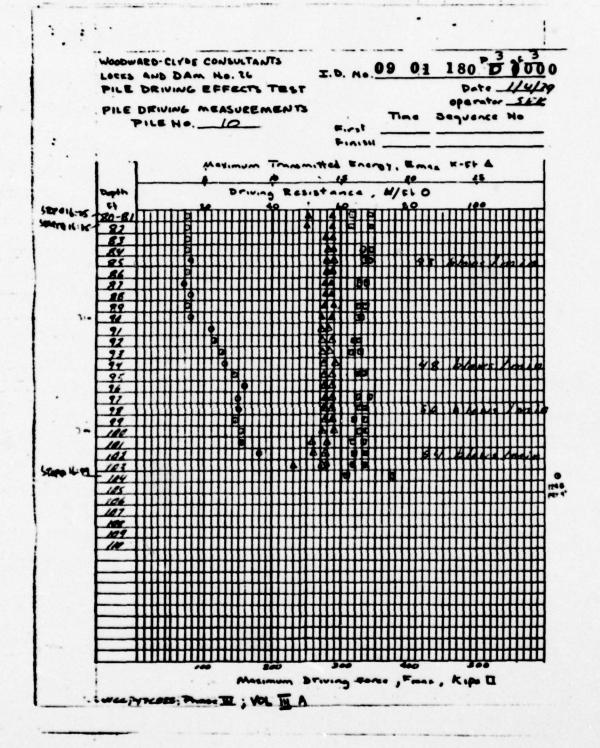


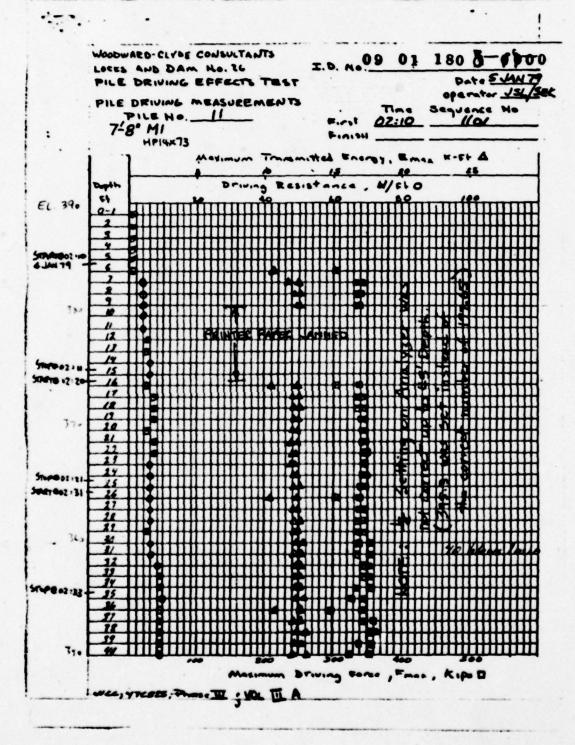
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,	Deth	Driving Resistance , W/ELO
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	42	
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STOPE 2002-	44	<u></u>
SARTETATE	- 46	
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SELACE J	51	
	53	
W/ 52-4"	54	
	56	
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		Mosimum Driving some , Fine , Kipo D

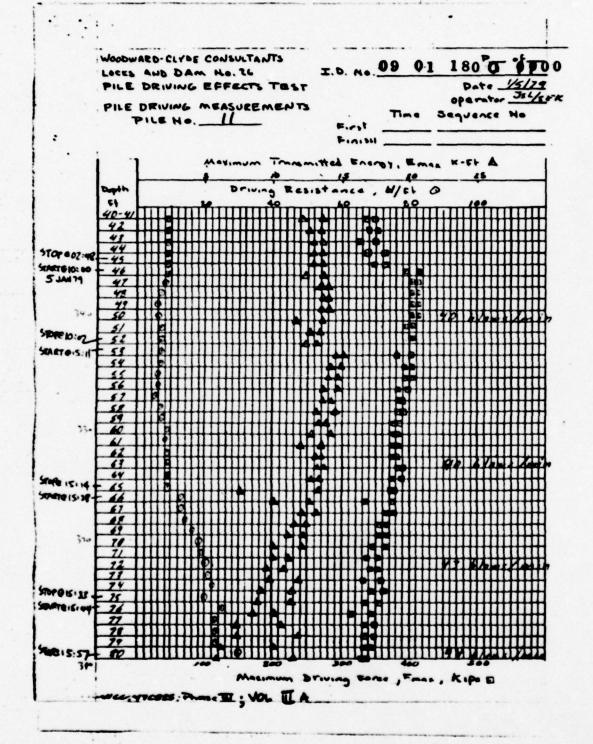


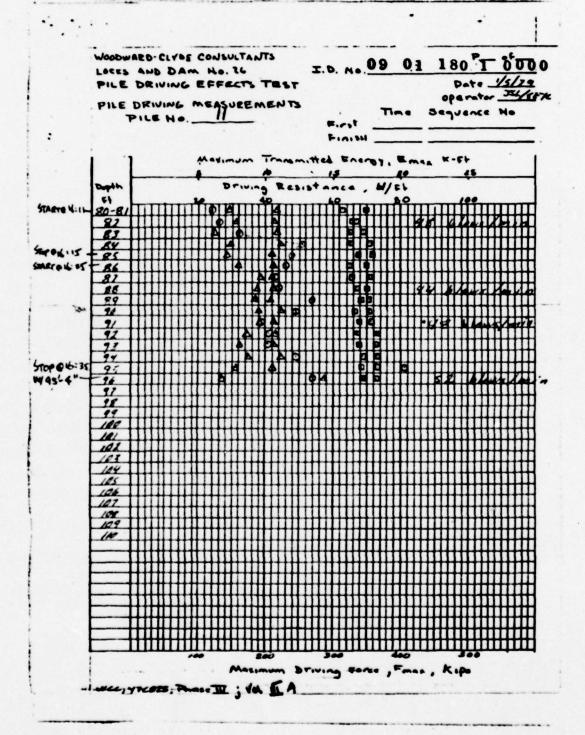
WOODWARD-CLYDE CONSULTANTS 00 01 180 BE CONSULTANTS								
TO 400 0 100 0								
PILE DRIVING EFFECTS TEST Date Ala 19								
operator SEE								
Time Sequence No								
20 # M1, 3 # Offset W. Frank 1649 1008								
HPICKTS Maximum Tomomitted Energy, Emes K-FFA								
A A 15 10 25								
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EL. 400 0-1 1001111111111111111111111111111								
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Maximum Driving Pares, Fines, Kips B								
Weeppress; Press II ; Sol II A								

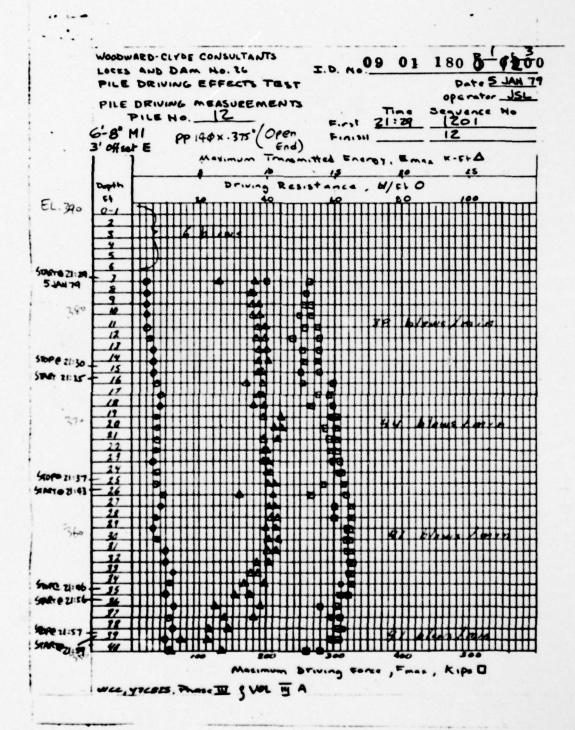
		ID-CLYDE CONSULTANTS AND DAM No. 26 I.D. No. 09 01 180	010
		RIVING EFFECTS TEST DA	te 1/4/
		RIVING MEASUREMENTS OPER	ator SE
		LE Ho. 10	ace No
		E.r.l	
		FIAISH	
		Maximum Tomomitted Energy, Emes K-FF	
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	46		1111111111
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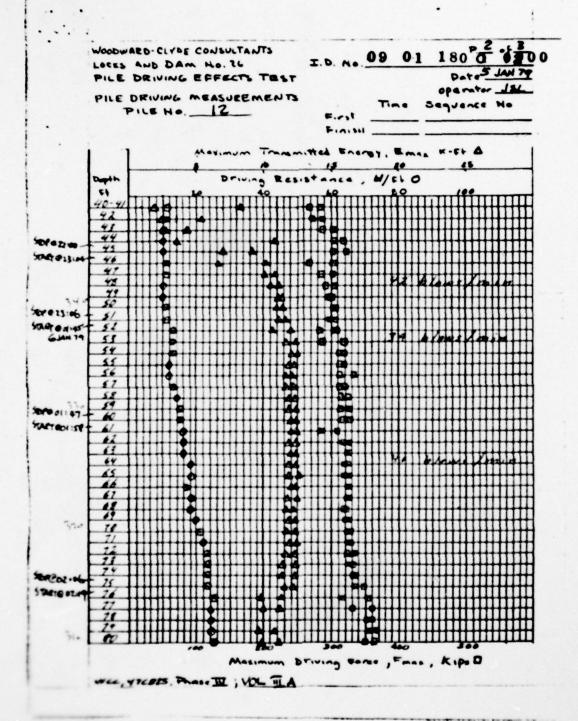


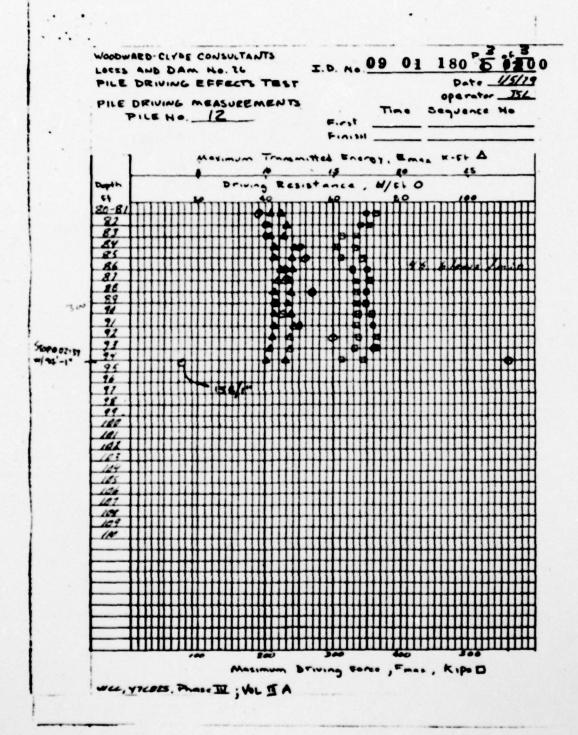


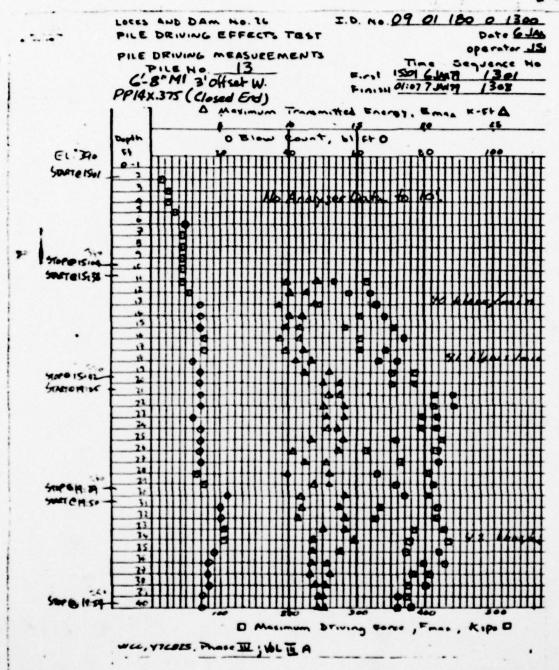


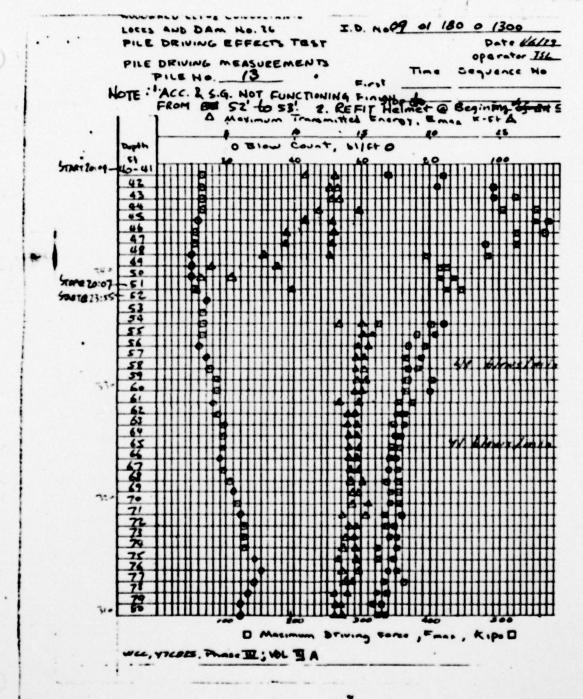












I.D. No. 09 01 180 0 1300 Date Maire operator 3L DRIVING MEASUREMENTS Time Sequence No Blow Count, bijeto D Macimum Driving some , Fman , Kips D WLL, YTCOES, PLANE II; WA I A

y7C825 Phase IV; Vol III A

1.7 ABSOLUTE DISPLACEMENTS OF MONOLITH MI

the absolute displacements of monolith during prototype to driving, presented in Tables L.1a and L.1b, are with respect to the position of monolith, completely unloaded, before prototype pile driving.

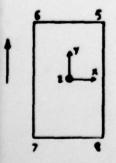
The absolute displacements of monolith presented in Table L. 2 are with respect to initial monolith position before preloading (no load applied); therefore, these displacement values represent total monolith displacements throughout the tests.

55	958.1	72.6	0.743	0.775
12/27 /15:18	****		0.759	0.775
65	357.4	72.6	0.757	0 785
12/27 /21:30		14.9	0.770	0 194
180	358.3	72.7		
12/28/09:12			0.784	0.810
183	359.1	78.3	0.777	0.785
12/23/13:47			0.783	0811
192	358.8	72.8	0.832	0.846
12/28/14.32			0.827	0. 848
197	358.1	12.7	0.819	0.840
12 28 /17:02			0 835	0.857
133	357.9	72.5	0.850	0.848
12/29/10/29			0.841	0.862
105	358.6	72.4		
12 29 /14 54			0840	0.859
215	358.3	72.8	0.379	0.896
12/29 / 18.25			0 886	0.896
- 112	358.5	12.4	0.881	0.901
12 30 /12:15			0.879	0.898
118	358 1	72.6		
12/30 /13 44			0.876	0 897
235	358.8	72.4	0.899	0 \$77
102 / 19:10			0.864	0.866
148	357.9	72.7	0.935	0.933
102 / 01:51			0 405	0.929
474	359 6	72.3		
103 /11:57			0.969	0.981
417	354.6	72.4	1.014	1.076
103/14:20			1.029	1.068

-0.255	-0.22	-0.140	-0.070	-0.105
-0 244	-0 224	-0.130	-0 094	-0 112
-0.260	-0.225	-0.160	-0.040	-0125
-0 254	-0.233	-0 134	-0.088	-0.111
-0.260	-0.230	-0.150	-0.100	-0125
-0943	-0.220	0.130	-0.106	0 199
0.000	1055	-01/0	-0.010	-0.122
-0.50	0 9 6 9	0.160	-0.00	-0.125
-0 2 14	-0.63A	-0.134	-0.107	-6131
-0110	-0.940	-0 140	-0.010	0115
			-0.105	
-0.265	-0218	-0.150	-0.100	-0125
-0 230	-0.204	-0.144	-0.108	-0.126
-0265	-0.233	-0.150	-0.100	-0.125
-0 246	-0 225	-0134	-0.104	-0 119
				- 113
-0.274	-0.855	-0131	-0.017	-01114
			-0.110	
0309	-0 290	-0110	-0.110	-0 140
-0.301	-4210	0.161	-0122	-0.141
-0 315	-0848	-0 190	-0.110	-0.150
-0.311	-0.289	-0187	-0.157	-0.172
-0.314	-0196	-0.184	-0.155	-0.170
			-0.120	

1104	544			1.358
105 /03:05	105/02 48			1.299
1105	550	363.0	73.3	1.368
105/11.37	105/14:57			1.327
1110	561	362.3	75.1	1.701
105/16:45	105/117			1.660
1205	598	359.5	73.6	1.789
105 123 00	106/01:43			1.724
1808	604	359 6	72.9	1.906
106/03:00	106 103:20			1.827
1300	606	360.6	73.2	1905
1 06/07 00	106 /15:01			1.862
1302	614	3608	71.7	2 039
1/06/17.40	1/06/19/25			1999
1305	618	360.1	73.2	2.207
106/20 30	106/23:39			2.102
1308	623	3603	73.6	2316
1 07 / 01:00	107/01:32			2.245
1303	619	361.8	72.7	2412
109/00:45	1 08 /00:23			2.257

	ent, in.				2.	-Compon	ent, in.			
,	•	•	•	•	п	7		78	2	Remerks
	O Co	plical Sy	Cyber De	19						
1278	1.276	1.176								No vertical survey
1.057	1.032	1.058	-0.441	-0496	-0468	-0.866	-0 084	-0.175	-0 322	No William Johns
1.334	1.320	1227	-0.480	-0.510	-0.465		-0.200			
1830	1.122	1.152	-0 447	-0.512	-0.479	-0.284	-0 100	-0.192	-0.336	
1333	1333	1 238							-0.378	
1.191	1.135	1.153	-0.440	-0.513	-0 476		the same of the sa	-0.196		
		- 17-	-0.460	-0.540	The second second second	-0310	Committee of the last of the l	-0.265		No horizontal survey
1.213	1.155		-0.492		-0.524	-0318	-		-0.370	
1.440	1.441	1.329	-0550	-0 600			-0 230		-0423	
1861	1.190	1.207	-0.564		-0.591	-0.344		The second second	-0.415	
1278	1453	1.332	-0.540	-0.615	-0578	-0.360	-0 270		0.447	Load cell channels inspeciable
1710	1/11	1488	-0.570	-0.660		-0.360 -0.360	-0.182		-0.424	I Visit at the second
1.406	1337	1.349	-0.581	-0.644	-0612	-0369	-0 270	-0 278	-0.465	Lord cell channels insperable
1.634	1.635	1.507	-0 690	-0.730	-0.710	-0.360	-0 260	-0310	-0.510	
1.4.54	1-381	1. 388	-0.660	-0.714			-0.175		-0 482	
2.031	2.030		-1.060	-1.145	-1.103	-0.690		-0610	-	
1.765	1.610	Contract of the last of the la	-1.042	-1.097	-1.069	-0.660		-0.561	-0815	
2.138	2.128	1.967	-1.140	-1.215	-1.178	-0.680		-0.615		
1.823	1.756	1.767	-1159	-1228	-1.194	-0.718	-0.527		8000-	
2.310	2.272	2.107	-1.480	1475	-1.448	-0.870		-0.810		
1.956	1.866	1889	-1.393	-1.462	-1.428	-0.891	-0.710	-0 800	-1.114	
1.325	2.293		-1.450		-1.480	-0.890	-0750	-0.820	-1.150	
1.959	1.701	1.908	-1.427		-1.462		-0695	-0.806		
2.537	2.505	2.329	The second second second second	-1.590	-1.560		Control of the last of the las	-0.835		
2.156	2.060	2.041			-1.512	-0935		-0.812	-1.162	
2.706	2.714	2.471	-1.680	-1785	-1.133	AND DESCRIPTION OF THE PERSON NAMED IN	AND DESCRIPTION OF THE PERSON NAMED IN	Action and party		
2.258	2.188	2.145			-1663			-0 906		
1.346	1.373	1.764	- 2.000	AND DESCRIPTION OF THE PERSON NAMED IN		-1.380		-1.190	-1622	
2.301	2.913	2.633	-1.906				-1.000	-1.168	-	
2.348	2.307		-1.923				-1.001	-0471	-1.653	
1	1	1	1			1 11	1	1	-11400	
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				III SELECTION						



ABSOLUTE DISPLACEMENTS

OF MONOLITH MI

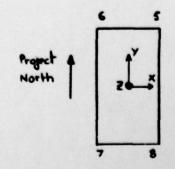
DURING PROTOTYPE PILE DRIVING

POURDATION INVESTIGATION AND TEST PROGRAM
ENISTING LOCAS AND DAM No. 20
OT LOUIS DISTRICT. CORPS OF ENGINEERS.

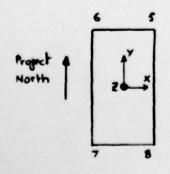
Comment Clyde Comments

Table L.I b

		Hor	izontal di	splacement	, the	
Displacements	5	6	7	8	Average	5
					firence pour	
at the end of preloading (mondith axially and	0.503	0.331	0.468	0.542	0.476	0.180
laterally unloaded)	0.653	0.434	0.447	0.524	0.514	0.211
prior to prototype pile driving (monolith axially and	1.287	1.148	1.382	1.377	1.299	0.370
laterally loaded)	1.418	1.186	1.185	1.260	1.262	0.415
at the end of prototype pile driving	2.515	2.789	3.277	3.455	3.109	2.210
(monolith axially and laterally loaded)	2.310	2.584	2.795	2.831	2.779	2.13
prior to load testing (monolith axially and	1.912	1.806	2.233	2.325	2.069	1.380
laterally unloaded)	2.010	1.715	1.922	1.952	1.899	1.990



ontal di	splacement	, iti-			Settlemen	t . in.			
7	8	Average	5	6	North Amage	7	8	South A verage	Average
		freeze point		ler dota				*** ****	
0.468	0.542	0.476	0.180	0.140	0.160	0000	0.170	0.130	0.145
0.447	0.524	0.514	0.211	0 218	0.214	0.161	0.164	0.163	0.183
1.332	1.377	1.299	0.370	0.345	0.358	0.210	0.250	0.230	0.294
1.185	1.260	1.262	0.412	0.454	0 433	0.283	0.239	0.261	0.947
3.277	3.455	3.109	2.210	2 9 50	e. 13 0	1.470	1.260	1.365	1.738
2.795	2.831	2.779	2.134	2.304	2.219	1.102	1.165	1.134	1.676
2.233	2.325	2.069	1-980	2.060	2.020	1.370	1-210	1.290	1.655
1.922	1.952	1.899	1.930	2.132	2.061	1.076	1.139	1.108	1.584



PILE DRIVING EFFECTS TEST PROGRAM ABSOLUTE DISPLACEMENTS OF MONOLITH MI

---------DACM49-70-C-0000

Woodword Chido Consultante Table 1.2

Y7C·825 Phase 1¥; VOL 111 A

L.8 INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR PROTOTYPE PILES OF MONOLITH MI

Monolith MI Prototype Pile No. 1 Pile Type HP14×73 Final Pile Penetration 52 ft

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	m2														_	
1	M3		V			IV			V			V	_		W	-
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7	F4		X	\times		X.	X		X	X.		X	X.	_	X.	X
	F.5		X	\times		×	X		X	X	_	×	X.		X	X
	F6	1	-	X		_	X.	_	-	×	_	-	X.		-	X
10	611-1	1	-		_	-	-		-	-	-	-	-		-	-
	611-15	-	-	_	-	-	-	-	-	-	-	-	-	-	-	
	6.1-50	-		_	-	1	-	_	-	-	-	1	-	-	-	-
-	FL	-	X	-	-	X	-	-	X	-	-	X	-	_	1	-
14	61-15	-	-	-		-	-	-	-	-	-	-	-	-	-	-
18	61-50	+	-		-	-	-		-	-		-	-		-	-
-1.1		1	-	X	-	-	15	-	-	-	-	-	-		-	-
12	63-15	+	-	-		-	-	-	-	-	-	-	-		-	-
	03-70	1	1			1	1	1	1	1	1	1	1		1	1

Monolith MI Prototype Pile No. 2. Pile Type HP 14x73 Final Pile Penetration 105 ft

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F/= 61-1 F2= G3-1

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

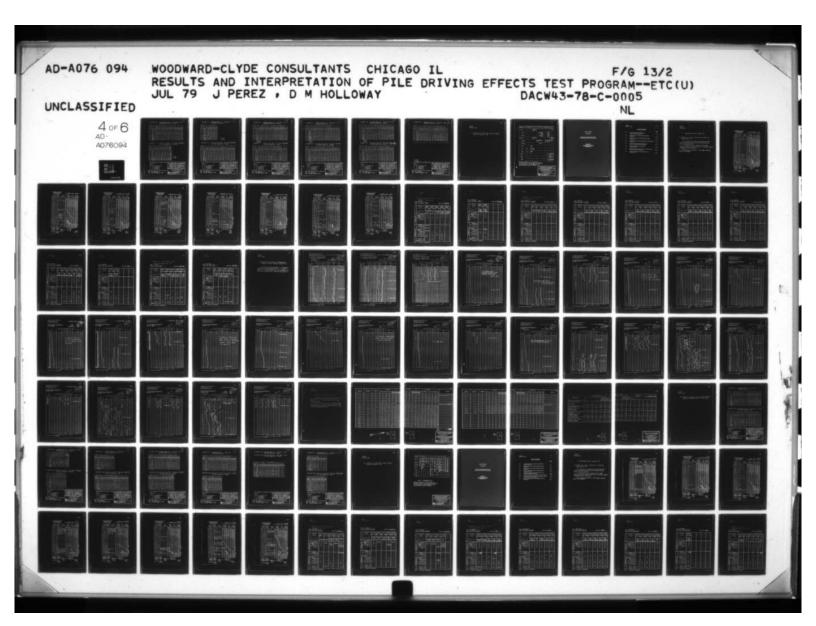
Legend

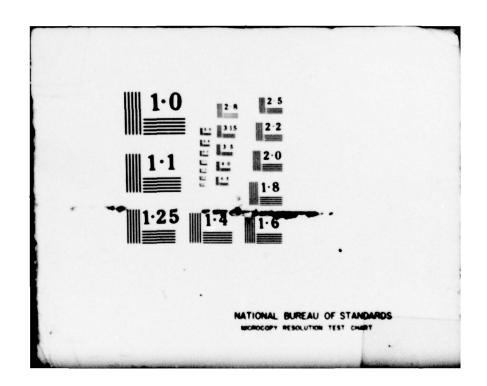
X all 3 components
T x component
L y component
V y component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITH MI PROTOTYPE PILES No. 1 AND 2





Prototype Pile No. 3 Pile Type HP 14x73 Final Pile Penetration 104.75 ft Monolith MI

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,	P11		V			V			V			V			V		-	V			V			V			X	X		×	X
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1	MI	_	Y	_		Y	_	_	V	_	_	Y	-	_	1X			V			Y			V			V			Y	
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1	613-1	-		_				_	_		_	_						_	_		-	_		_							
	FI	1	X	X		×	X		×	X	_	×	X	-	X	X		×	X		X	X		×	X		X			X	
7	FY		X	_		×	_		X	_	-	IX.			×		-	X			X			X			V			V	
•	FS		X	×		×	X		X			X.	×	_	×	X		X	×		X			×	×		X	X		×	X
•	FL	_	_	X.			X		_	×	-	-	X			X			X			X			X			X			X
10	DII-1	1	_						-	1	_	-	-		-																
	611-15	_	_	_		-		_	1	_	_	-	_		-		_				_										
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12	. F/	1	K	-		X	_		X	-	_	X.	-		X		_	X			X	_		×	_		X			X	
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,.	63-60	1_		1								1																			

Prototype Pile No.4. Pile Type HP14x73
Funal Pile Penetration 106.5 ft Monolith MI

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	MA													_		_		1	-
1	₩3																		_
	614-1																	_	_
	6:3-1			X.			X			X			X			X			X
	F3_	_						_	_										_
7	Fy		X.			×			X			X		-	X	_	_	X	_
•	FF		_	X.	_	_	×			X.		_	X.	_	-	X	_	-	X
•	06		_	IX.		_	1×			X			X			X	-	-	X.
10	611-1	_		X	_	-	×	_	_	X			X	-	-	X	_	-	X
	GUIS	_	_	-	_	-	_		-	_			_	-	_	_	-	-	-
14	611-6	1_	-	-		-	_	-	-	-	_		_		-	_	-	-	-
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14	61-15	-	Y	-		V	-	_	Y		_	V	_		Y	_		Y	_
	61-3	-	-	-		1	-	_	-	_	-	-	_	-	-	-	-	-	-
	7.52	-	X,	_	_	X,			X	_		×			X	-	-	X,	
17	61.12	1	V	-	-	Y	-		Y			Y	-	-	Y	_	_	Y	_
,.	61-50	1				1			1										

FI . G !-! F2 : G3-1

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components T x component

y component component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITH MI PROTOTYPE PILES No. 3 and 4

Monolith MI Prototype Pile No. 5 Pile Type HF 14x 73 Final Pile Penetration 52 ft

	N.		1		2			3				
Pile Pon	-		"		25		-	15		Ι.	52	
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	MZ											
,	m3											
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	013-1			X								
	13											
7	14		X		×			×				_
	FS			X		X			X			
,	F6		×		X			X				
	611-1			X		X			X			_
	611-15		_		 _			_				_
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17	61-18		V		 Y	_		V			_	_
,.	03-50											

* FI = GI-1 F2: G3-1

Prototype Pile No.6. Pile Type HP 14x73 Funal Pile Penetration 104.1 ft Monolith MI

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7	A																						_	_					_	_
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•	+ F6																							_			_			_
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4	1611-15		_																-				_	_		_	1		\square	_
44	-511-50		_		_				_			_									_		_	_	_	_	-			_
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11	101.20		_			_												_			_		_	_			-			_
11	P. F2		_	X	-	X	_		1		_	X			X		_	X		_	_	_	-	_	-		-	_		_
17	69.15	_	X		 K			X			×					-	X						-		_	_	-	_		_
,0	163-60		1																											_

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

all 3 components

x component

y component component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITH MI PROTOTYPE PILES No. 5 and 6

Prototype Pile No. 7 Pile Type HP 14x73 Final Pile Penetration 104 ft Monolith MI

-	No.		1			2			3			5			6		0	7			17			08			25				
Pile Pen	tation.		11			25	-	-	15			57	,		70			20			85			90			00				
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,	#12																														
1	-																														
1	64-1																														
	GIL-I												_																		
	f 2																														
7	F.5											_	_	1	-																_
	411-1					_							_	_	_																
	411-15	1	1		_	_	_					_	_	_	_						X										
	411.50	_	-			_	_	_				_	_	1_	-																
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	61-15	-	X	_		X	_	_	×		_	A.	-	_	X.	_		X			N.			×			7				_
12	61-61	-	X	-		×	-	-	X	_		L	1_	_		_					X			×			×				_
11	62:15	1	-	_		_	-	-		-	_	_	-	_	-								_	_							
.1	42.60	1	-	_		-	_			-		_	-	_	_	_															
	· 11	-	-	X		-	X		-	X		-	1	-	-	A			X			×		_	2			1			_
12	63-15	-	X	_	_	X.	_	_	X	_		1	_		×			X						×			×				
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F2. 63-1

Prototype Pile No.8. Pile Type HP14x73 Funal Pile Penetration 103ft Monolith MI

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	MI	_													-	4	_		-				_		_			_	_	
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1	611-15	-	-	-	-	-	_	-	_	-			_	-	-	-		_	_	-				-	-	-	-	-		-
4	611-50	+-		-		-	-	-	_	-	-	-	-	-	-	=	-	-	-	-	-	-		-	-	_	-	-	-	-
		-	-	7	_		X	-	-	1	-	-	X.	-	3	×	-	-	×	-		-		-	K	_	-	-		+
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4	61-50	+	×	-		-	-	-		-	-	1	-	-	-+	+		X	-	-	-	-	-	-	-	-	-	-	-	-
14	62-15	+	-	-	-	-	-	-	-	-	1		-	-	+	-	-	-	-	-	-	-	-		-	-	-	-	_	-
4	61.50	+	-	-	-	-	T	-	-		-		7	-	+	v	-	-	×	-	-	×	-	-	×	-	-	-	-	-
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Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components T x component

y component component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM

INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITH MI PROTOTYPE PILES No. 7 and 8

Monolith MI Prototype Pile No. 9 Pile Type HP 14×73 Final Pile Penetration 10++

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-	613-1																													
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7	F.S																													
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11	62-50		-	-	-	-	_	_	-	-			-	-	-	-	_	-	-	-	_	-			_	_			_	-
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,.	43-20																													

FI: GI-1 F2. G3-1

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Prototype Pile No. 10. Pile Type HP 14x73 Funal Pile Penetration 103.75ft Monoleth MI

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, •	61.50					1									1							_					1				

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component

y component a component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITH MI PROTOTYPE PILES No. 9 and 10

046843-78-C-0008

****** PA E ; WI II A

Prototype Pile No. 11 Pile Type HP 14x73 Final Pile Penetration 95.4 ft Monolith MI

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, •	41-50													-																	

. FI: GI-1 F2:63-1

Prototype Pile No. 12, Pile Type PP 14x 0.375 Funal Pile Penetration 94.1ft (open-ended Monolith MI (open - ended)

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,	MI		X			X			X			X			X			V			V			V							
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11	61-15							_																							
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,.	61-50			. 4									X			1			X	4		X			X						

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

all 3 components

x component

y component a component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM

INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITH MI PROTOTYPE PILES No. 11 and 12

Monolith MI Prototype Pile No. 13 Pile Type PP 14x 0.375 Final Pile Penetration 93 ft (hose-ended)

	N.	1.	301			130	2	13	03		13	50	4	13	20	1	130	6	13	30	7	1	30	8					
Pile Pere	tration	1	19"			10		2	0			30		4	0	1	51		6	.0		-	70			93			
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1	64-1					-			-						1	1													
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	73														1	1	1												-
,	FE										-				1	1	_	_								-			_
•	611-1		×			X			X.			Y		1	/	1	IX			X			X					_	-
•	61.15	_	X			X			X.					-	-	1	1	1	_	_						_			-
10	611.50				_										-	-	X	_	_	X.			X			_	-		-
"	FI		X			×		_	X.	-	_	V		- 1	Y	1	X	_	_	X			X			_			-
	61-15	_				-	_		-				_	1	-	-	1	1	_	_	-			_	_	_		-	-
12	61.50			X		-	X		-	X	-	_	×	-	_X	4	-	X	_	-	X		_	X		_	-		-
11	62-15	_	_	X			×		-	X		_	X	-	12	_	1	-						-	_	_		_	-
11	67:50	_		-		-	-		-	-				-	-	1	1	X	_	-	X			X		_	-	_	-
10	FL	-	_	X	-	-	X.		-	\mathbf{X}	-	X		-	×	1	IX	-	-	X	A Talantesia		X	_	-	_			-
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	63-50			X			X			X			X		10		1	IX			X			X					

* F1: 61-1 F2: G3-1

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component

y component component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITH MI

PROTOTYPE PILE

YAC-825 Phase IV; Vol III A

L.9 INFORMATION DIGITIZED FROM ANALOG MAGNETIC TAPE FOR MONOLITH MI

Geophone Nb.	Prot	oty	n Ai	le l	Vo. c	and	Dept	h of	Di	gitig	atio	on (f	t)
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FI : GI-I				15,48, 90	15,46								70
GI-15							30, 45	30,45 60,103			20,35, 50,70		
G1-50							30,45	3945 60,103			20,35 50,70		
F2 . G3-1				15,48, 90								51,70	35, S
G3-15						30,46	30,45	6		30,45	20,35 50,70	51,70	20
63·50							30,45	60					
F3			15,80										
. F4	15		15,80	15,90									
F5	15		15,80										
MGI				×						8		20,55, 50	-
MG2							2,18				90	20,35, 50	36,28
MG3		,										20,35,	

Depth of Digitization is the prototype pile tip depth at which the digitized data recorded during the tests on analog magnetic tape, were processed through a computer.

INFORMATION DIGITIZED
FROM ANALOG MAGNETIC TAPE
FOR MONOLITH M1

FOUNDATION INVESTIGATION AND TEST PROGRAM
EXISTING LOCKS AND SAM No. 20
ST LOUIS DISTRICT. CORPS OF ENGINEERS.

Weedings Opti Consultants

PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDIX M
MEASUREMENT DETAILS
MONOLITH M2

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M.2	Summary Log of Dta Acquired During Preloading, Monolith M2	M-10
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Y7C-825 Phase IV; vol IIA

M MEASUREMENT DETAILS, MONOLITH M2

M.I COMPLETE FIELD LOGS OF INSTALLATION OF TIMBER PILES UNDER MONOLITH M2

The identification number (Id. No.) at the top right-hand corner of each data sheet includes the timber pile number shown in Fig. 5.2, Volume III.

The timber pile number is given by the two digits

Preceeding the last two years of the Id. No. (for example, page M-2 corresponds to timber pile No. 14)

The field logs are presented in chronological order of timber pile installation.

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 03 02 160 1 1400

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WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST

TON. 03 02 160 1 3000

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WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 08 02 160 1 0900

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11			1	1	1	11	1-	11	4	1	1	Ш	Ш	11	H	1
11			1	+		ш	+	#	4	1	4	Щ	Ш	+	H	Ŧ
-11		light and word of selan and	-	1	11	11	1	11	4		1	1	4	1	н	1
11		An 11 - 27	-	4	1	-	+	11	4		4	1	+	+	H	Ŧ
13		In water	-	4	1	1	1	11	1		4		Ш	4	H	ŧ
	-		-	44	11	-	+-	11	4	+	+		+	+	H	Ŧ
-11		his word from 100	-	+	+	-	+	-	+	-	+	1	+	++	н	÷
		ily sell in when early	-	+	+	-	+-	H	+	-	-	-	+	+	H	t
19	1	lac minister		+	+	-	+	++	H	+	+		+	+	H	t
		los reliabilion	-	d	-		+	H	+		+		+	++	++	t
	10		-	Ť	-		+	++	+		+		+	+	H	t
	12		-	-	0		+-	+	+	-	+		÷	+	Ħ	t
-4-	17		1	Ħ	Ť	d	+	+	1	-	+		+	+	ii	t
11	2.0		1	T		Ĭ	•	1			+		1	1	11	t
16	14		1	T	1		T	61		-	T		T	1	11	t
N	24	51 Howelm	1	Ħ	T		11	10				T	11	11	1	t
24	31	51 Alra/m	1	Ħ	11	1	17	11	15		П	1	11	11		T
11	36			Ħ			1	1		-	1		1	1		1
20	45		1	П			T		i		1		Q	1	1	I
21	37	Prolyget		\mathbf{I}			10	3	88		O.				1	I
),	42	1		П			I		30		1	•	1	11	11	I
U	62		111	П	11	, ,	L	0	Н.	1			Ш		i	1
21	. (1		11	П	Ш			1		1		_	Ш	11	П	1
- 22	21/40		11.	4	Ш	1	1	11	Ш	1	1	Ш	Щ	11	Ц	1
	11 141	pastale of 10/26/79 at	1 1	Ц	+		1	#		\$		44	4	14	ы	L
	-	00 0144	11.1	4		-	44	4		4	щ	Щ	4	#	H	4
			-	4	_	4	44	#		Ш		Щ	4	#	н	Ŧ
			+-	H		-	++	#	4			Щ	4	#	н	ŧ
			1	Щ	-	ш		-	7	_	u	Ш		==	щ	1
01/17	10 D	Port 4	6.0.6			0	P	4			_					

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

FON. 03 02 160 1 1700

Pite Type Douglas For	Hammer	Vulcan K	Date	210-11978
Pile length _42'	Energy .	" Samit like	Time	17.45
Grand al. Treat had	· oterating pal	e 60 blarfen	Zas being	17.45 Re- Bob Green

Eq.	Blows	Remarks	:	D		7			.+	-	••	1	11	64			*	1
			1			TT	-	-		4	1	T	۲	TT	Ť	-	77	4
<u></u>	-		+	++	₩	++	+	+	Н	+	++	++	+	++	H	++	H	1
	-		+	1	#	++	+	4	ш	4	#	#	#	H	+	#	H	4
		Be- setting to 23'.	1	1	H	44	4	н	ш	4	#	4	н	44	44	44	н	4
•		Herd lawer at 23' Hat	1		П	11		Ц	Ш	1	11	11	П	11	1	П	П	
•		the constable to let	1		Π	П	I	П	Ш	П	П	П	П	П		П	П	
-		Heraush.		111	П	П	I	П	Ш	81	П	П	11	П	П	П	П	1
3		Pile You to B.	i	1 1	П	П	Ι	П	Ш	П	П	П	П	П	П	П	П	
•			i	111	П	П	П	П	П	П	П	П	П	П	ш	П	П	3
. 9	1		N	П	П	П	Т	П	П	Т	П	П	П	П	П	П	П	1
	1		110	5	П	Ħ	T		П	T	П	П	П	П	П	П	П	1
	12		П		Tá	П	Т	T	Ш	T	TT	П	П	П	П	П	П	1
-11	16		1	1.1	П	6	T	1		Ť	П	1	П	П	T	П	П	1
11	14	36 black frie	1	111	11	3	T	1		T	1	1	T	11	Т		П	1
11	12	7	1	-	18	1	1		1	+	1	11	-	11		_	Ħ	1
The second secon	13		1	-	۲	1	+		T	+	1	11	1	11	1	7	H	1
13	15		1	-	+3	0	+	-	-	+	11	+	1-	1	+	+	H	1
4	-		+-	-	+-	×	٠	-	+	t	++	+	┥	+		-	н	ń
-0_	15		+-	-	+:	_	T	H	-	+	-	+	H	-1	+		н	1
1	10		+	-+	H		ī	-	-	t	+	+	+-	+	T	-	н	1
19_	13		+-	1	+-	-	۲	-	++	t	Ħ	+	H	Ħ	1		н	1
_11	22		+-	-	+-	+	÷	12	-	+	-	+	-	H	Ť	-	н	H
L	26		-	-	+		÷	-	-	4	+	H	1	+1	-	-	H	4
	24		-	-+	++	-	+	-	0	+	+	H	÷	++	-	+	+	4
ш.	28		+-	-	++		+	-	LIG	-	-	4	н	++	÷	-	4	-
11	33		+-	-	44	-	+	-	ш	4	P	_	н	44	-	1	+	Н
11	35	58 blace foir	4	-	4	-	+	+	н	4	+-	Q.	4	++	-	-	4	Н
1	40		4	-	14	11	4	4	1	4	1	ш	4	Н	1	Ц	щ	H
L	44		щ	-	ш	11	4	4	ш	4	-	щ	щ	9	+	4	1	יג
11	57		Ш	1	1	1:	1	1	1	1	11	Ш	Ц	11		1	0	Ц
11	73	Telling get to 95'	П	4	L	1	4	1		4	1	L	1	Н	1	1	1	Ľ
20	44	40134	Ц	1	L	1	1	1		4	1	1	Ц	19		Ш	-	4
21	61		П	1	L	1	1	0 3	_	4	1	1	4	11	4	Ш	+	4
1	33	Jetter, set at, 27	1	1	ш	1	1	2	-	4	1	11	ш	11	1	Щ	Щ	3
11	76		11	11	ш	1.	1	L		9	11	11	Ц	1	Ш	Ш	9	I.
24	114	Jettra set at 22'	Ц	11	ш	11	1	0		3	ш	Ц	ш	11	ш	Ш	11	1
11	35.3.		11.	11	Ш	11	1	1	LIG	吐	12		ш	Ц	Ш	Ш		J
	1461.	sunds on whicht	11		L	11	1	1	1	d	YI.	1	4	40	d	N		Ŀ
		at 23:45 Ms.	П		L		1	1	111			L	П	П	P	11		
		4 7 1	11		L	11	1	L	Ш	1	Ш	П	П	П				1
			II.	11	L	П	П			1	П	П	П	П		Ш	ш	I
			11	1 1	L	П	1	i		1	П	П	П	П		П	•	1
)	2 - 36 3 Al Ann	•	cai		• (-		3	k.	-				A 34/5	~ ~ ~	47
ce, 47	CO15 , 77	NASON 1.5%.E													-		,	

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 03 02 160 1 4600

45	Blows	Remorts	0 Dr.		30	3.5	+		-	517	E4	_	*	Ī
				-		-		•	*	-	-			7
	-	N. 20 1. 27'	1111	###	Н	#	Н	111	+	++	++	₩	H	t
+	-	No how to 5'	1117	111	Ш	#	Ħ	Hi	1	H	#	Ħ	H	t
•	_		11111	111	П	11	iT		IT	П	TT	П	П	Г
	1		11 :	111	Ш	11	II		I	11	11	IT	IT	ľ
•			O1:	Ш	Ш	П	1		I	11	11	П	П	Γ
2	4		9	##	Ш	#	Ш	11	4	++	#	#	H	Ł
•	1		101	##	Ш	#	Н		+		₩	₩	₩	ł
1	3		0	+++	Н	#	₩		+	++	#	H	H	t
•	10		, .	011	H	1	#	11	+	11	11	Ħ	T	t
	14			10	- 1	T	•	1 '	1	•	II	I	II	Γ
	18			11	•	1	1.1		1	11	11	1	П	Γ
14	20		X 1	11	-	1	11		1		1.	_	11	Ł
13	25_			1	4	- 12	-	_	1	-	1	÷	4	Ł
14	29			-	+	Ť	-	-	+	-	+	+	H	۲
	34		1 1	1	1	+		0	T		11	T	1	t
,.	36	57 Have / ni	1. 1		1	1	1 .	. 0		1.1	11	I	īI	Ι
	46		11 1		1		11	-	1	11	01	L	Ш	1
u	41	ily byer would strape	. 1	1.	1	1	1	1 .	Ц	0	11	1	11	ļ
4	39_		1	-	+	+	-	1 :	0	-	0	+	₩	ł
4	AS_			+-	+	+		-	+	-	10	1	₩	t
19	52		1 1	+	1	1	1	1	1	11	-	10	11	t
**	53		61	11	1	1	11	1	T		11	Ti	11	K
u I	62	Telba, get to 24'		1	1	11	1	1	1 1		11	1	1.	Ι
u	67		1		1	1	1	;	1	1		+	1.	1
	75	Tellow, not to 93' Tellow, not to 93' Tellow, not to 26' Augus	+-+	-	-	-	-	1	+	-	-	+	-	+
	43	Letter, set b Pr	+ -1	+	+	7-6	1	+	+	-	+	#	11	t
34	21	2 Hay 3 1 to 26' 1-30	1	11.	T		11	1		1	11	Ħ	17	t
	118			1			11	I.	1		II	ഥ	T	Γ
14	135.		111	111	1		11	Щ	1	1	11	11	1	1
15 5	161	A/A-6/14/76	1	111	4	4	14	4		H	#	#	H	+
-		of 00 - 52 get	+++	++	-4	4	1:	-	1	+	++	#	H	+
-			1	++	+	Ħ	i		H	H	#	Ħ	H	t
				1	11	1		11	T	T	11	T	IT	T
			1 .	II	•	11			I	III	II	П	П	Ī
		rents YES	•	50	~	-			_	~	-	200	,	é
	. 1	2014			Cal	P -•	,Ty	, Ky	-					
(PDA)		10:31 Notes										0	M	
		5.5% S								V		50	Co-	,

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 20 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

FON. 08 02 160 1 0800

epth :	Blows	Remorts	0 D-	2177	Res				51/0			*	j
0-1	1		1111	10		1111			m	11	'n	-	H
	+-+-	Pre-pet to 24'	11111	+++	##	нн	#	##	111	++	Н	Н	1
-	1	Pile ruce to 4'6"	1111	111	111	ш	Ħ	H	Ħ	#	Ш	Н	1
-			1111	111	111	ш	Ħ	ш	H	\mathbf{T}	ш	т	٦
•	200 4"		116	+++	***	ш	#	***	111	#	Н	н	d
-	3		0	\mathbf{T}	\mathbf{H}	Ш	#	ш	Ш	\mathbf{I}	Ш	Ш	
3	1		110	Ш	Ш	Ш	Π	П	Ш	Π	Ш	П]
•	1 9			dШ	Ш	Ш	П	Ш	Ш	Ш	Щ	Ш	1
	14			114	Ш	Ш	Щ	Ш	Щ	Ш	Щ	Ш	1
-	21		11.	444	1110	444	#	ш	ш	ш	Щ	щ	4
11	24		-	##	₩	9	+	Н	##	#	Ш	Н	H
-11	1 20		+	+++	+++		+	+++	+++	₩	Н	Н	4
-14	33		+	+++	+++	-	10	++	1	++	H	H	1
13	34		1	+++	+++	111	-	-	11	17	П	Ħ	1
14	29		1.1	111	-11	111	1	111	1	#	H	Н	1
11	31				Π		o		111	T	Ш	П	1
14	33		111	Ш	Ш			10	11			\mathbf{I}	3
19	41		11.		\Box			11	D		1	П]
10	45		11.				1	111		41	Ш	Ш	1
-14	48		1	11.	-11	111	44	111	11	10	Ш	Щ	4
-11	1 45		-	-	-11	114	#		+	4	-	Щ	4
-41	53		+	4	₩	++	₩		н	+	-	-6	К
-11	65		1	+	+++	++	₩	-	H	+		+	-
15	51		1	1	++	111	#	++	H	11	6	+	H
1/	1	let just to 84'		11	-11	111	#	++		11	Ī	-	i
24	141			111	TIT		Ħ	П	11.	1	11	1	1
11	75	Jata pai to 27					п	Ш	Ш				ā
20	72			Ш			Π		Ш	L	Ш	1	3
21	31	and you blow to 28'		Щ	-11	11	12		ш	#	Ш	1	ŀ
<u></u>	92	<u> </u>	+	+++	#	444	#	-	++	#	ш	ij	ď
11	102		++-++	##	+++	+++	Æ	밐	++	#	Н	+	
35	166 10.0	ps 10/26/78	11-11	+++	+++	-	12	7	H	#	H	,	1
	1	4 00:15 M	11:11	+++	† † †		1	Ħ	1	#		4	T'
		-	11 11	1	-	111	11	111	Ħ	1	Ш	Н	1
		10.00			Ш	Ш	1	Ш	щ	T	П	П	1
			115		Ш	Ш	Π	Ш	Ш	П	П	П	J
-					Ш	-	П	Ш	Ш	П	Ш	I	J
-	-	ente yes	•		-		-	. 1	-		20		
01/10	Die E	Sharing.			CAP	1	٠,	4					
1/1		Tars Motos	-1 6								-		
-		= 2.0% N	-1							7	3	a	

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 29 PRE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 03 02 160 1 2000

esth :	Blows	Remores Person par	: %:		*			.+-		ė		1/6		7.	*
0-1			111	I	II	II	II	Ш	Ĭ	1	II	П	Ц	ĬŢ	П
		Recal to 27	1111	4	Н	#	Ħ	Ш	Н	11	4	#	#	#	Н
-		The same to 10 dold	 	4	H	++	ł÷	144	H	!!	H	#	#	₩	Н
•			111	4	H	44	#	##	H	++	H	#	#	#	н
1	-		111	+	H	++	! +	111	H	++	H	++	₩	₩	Н
<u> </u>	-		111	H	H	++	ti	11;	ti	11	H	++	#	Ħ	H
			11:1	H	ti	††	Ħ	ĦŦ	ti	TI	Ħ	11	Ħ	Ħ	H
•			titi	ıt	tt	Ħ	ti	Ht	ti	11	Ħ	ti	Ħ	H	IT
•	1		11.1		11	H	I	III	ľ	TT	П	II	П	П	П
ü			1	I	11	11	L	11		!!	П	11	11	П	II
**	1			1	11	11	1	11.	1	11	1	11	11	1	1
11	-	south they belle	-	4	11	11	1	111	L	1	4	1	11	1	Н
11	- Jane	Lock	-	+	-		-	111	H	. !	H	+	++	-	H
13	-		-	+	-	+	-	1	+		H	-	1:	÷	+
-14	++	late calculation	+	+	-	+	-	-	+	1.	Ħ		+	†÷	+
14			1	Ħ	-	T	1	1	+	1	Ħ		T	T	1
19	8		1 .	ot	T	1		1 .	I	1 4	П	11	11		П
10	16			П	L	01		11		:1	П	11	11	1	II
N	17		-	1		0		11	П	. 1	Ц	-1	11	1	Ш
-11	20		-	4		. !	-	1.	L	11	4	"1	11	1	11
-11	24		A CONTRACTOR OF THE PARTY OF	+	1	1	-		+	-	4	++	11	1	1
24	36	and light they full (2.0"	_	-	-	÷	-	1.0	+	•	4	++	++	÷	H
15	40	- 15-4 15 May (1.14)	CASSESSED COMPACED	+	-	+	+	111	t	-	id	1	TT	÷	+
v	46		- ONL WATER BOTH	†	1	-	1	11	Ħ	1				+	
2.0	50		1	IT	, .	1	1		1	1	1	1		51	
	56		1	I	_			1		1	1	7	•		0
20	6		-	Ц			L	1	L	1		1	1	1	
21	7 12 45	Analyze	-	#	-	1	1_		Ц		4		11	1	1
7:	56	S/A-/	1	H	1	0	-	10	-		4	-	++	#	2
-11	71	SI Blood Journ	+ -	Н	-	-	-	5	-	+	+	+	+	+	-
35	44 64 76	1	11:	H	ii		-	10	-	ii	1	11	#	#	+
	Ope	A shale on injects of	1 1	Ħ	1	1	1.			11	ī	11	#	H	H
		00:17 4	11 1	ī		: 1	T.	11.		П	I	П	II	I	П
			1	Ц	1		1	11.		П	П	П	П	П	П
			-	4	4	11	1	11	4	Щ	Ц	11	11	ш	Щ
				Ī	۰	11	-	"	Π	Ш	-	11	щ	<u>H</u>	ш
40000	-	ments in	•				-				24		•		
01/10/		L-34-4 Nidan			_	-	-	*	٠,	7	•				
51 (A)	UT 1	TE 15.1 Pile beer at a						Rad D							

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. US 02 160 1 TOOO

Eq.	Blows	Remorts	:3	7:3	3.	25		-	-	110	A		*
0-1			11	Ш	III	Ш	Ш	Π	I	Ш	П	m	П
		perjet to 27'	Π	Ш	Ш	Ш	Ш	Ш		Ш	П	Ш	\perp
		Pile front to 2	Ш	<u>.</u>	111	111	Ш	Ш	1	11	#	Ш	Щ
•			111	11	Ш	Ш	Ш	Ш	Ш	Ш	Ш	Ш	Ш
3	2.7		111	_	Ш	111	Ш	Ш	Ш	11	Щ.	Ш	Ш
•	Med		11	-	#	11	111	111	1	11	#	Ш	Н
2	-	Liquite	111	-	##	Hł	₩	11:	4	++	₩	Н	Н
	-	1-10 west time	+	1	₩	H÷	+++	H÷	щ	++	₩	Н	H
-1	1		+	+	***	H÷	H÷	+++	н	++	₩	Н	Н
	16		1	-	110	1	11:	11	H	1	#	Н	+
"	17	some at 12	1	1	T G	1	-	11		11	11	H	Ħ
11	20	-	1	1	111		111	1	11	11	TT	T	П
14	2.1			1	111	0	11.	1	I		1.		\mathbf{I}
15	2.2	15 lose colontation		;	11	10	-	1	1	-	11		1
14	25			1		1	D.	1.1	-		1	1	Ш
.,	24		-	+		4	10	11	4	1.1	11	11	Н
14	21		1	+	-	Η-	1 6	-	+	11	+	-	н
19	33		-	+	-	+	+++		+	++	-	H	н
10	36	grand dyn at 20'	+-	\forall	1	+	1	-	#	0	+	H	н
-N	43	me date for the mul	-	#	-	+	-	1	+	-	#	H	Н
4		in sale for the sand	1-	it	1 . 1		1	1	1	1	11	1	H
21	31		1	1	1 . 1	1	111	5	T	11	11		ш
15	32		1 -	1	1		1.8	•	1	11	11	1	\mathbf{I}
26	42			1	1 :	10	11	1		•	11	1	1
u	50		1	1	-	1	111	1	11	i	11	Ш	-
11	55		1	4		1	111	1	i	-	1	Ш	0
	43		1	-11	-	+	1	+		0	-	H	-
2.	2.1	Andrew Set at 11 day de	-	#	-		++	+	4	-	+-	+	Ť
31	22	70 97 17	1	Ħ	1.	To	-	-	-	-	#	Н	T
1)	27 6 5"	3d of 3	1	1	11.	1	1 16	•	=	P	TT	H	1
34	74	¥ 20 1		1	111	I	111	111	1		o L	П	1
33	6160	Total 31 dans dans		П	11		111	0	\pm	91	11	Ш	\mathbf{I}
	71 646	As style of infested of	-	Ц	11:	-	114		4	4	11	1	ď,
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-			1	+	-11	+	+	+++	Н	#	++	ш	H
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01 (1)) 30	- M-75 NA	1 6.0		• 0	-0-	4	y Ki	-				

Francis Vol III A

M. SUMMARY LOG OF BATA ACQUIFE DUF 115

PRELOADING , MONOLITH M2

ID No .: 07-02

MONOLITH(S) TESTED: M2

TEST TYPE: TRANSMIG

	Sequence No.	0000	0005	0010	2100	0013
	Date/Time	1/10/21	11149 2145	1300	1/1/19	2100
	Description of Event	SWITING BANG	FULLY	FULL ATIAL No LAPPEAL LOADS	FULL ARIML ALAMBAL "CYPLE I"	FUL MAINL UNLOSDIAMENTE (Maho) LOSOS "CYCLE I"
	Dial Gages, P(1)			/		
	Optical Horizontal Control. P(1)				/	1
DATA	Optical Vertical P(1)		~	/	/	/
	Tape Extensometer, P(1)	1	1			
MARY	Tilt Meters, P(1)					
PRI						
	Timber Pile Inclinometers, S(9)	V(prior)		1	1	
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	1(prior)		/		
TA	Surface Settlement, S(11)					
DAT	Ground Inclingmeters, S(12)	1 (prior)				
	Sondex, S(12)					
V	Piezometers, S(13)	/	1	1	/	
SECONDARY	Thermo-couples, S(14)	/	1		1	
SEC	Strain Gages, S(10)	BAL			/	
	Record No 02		4		5	
	N/A Record No 03					

MONOLITHIS) TESTED: MZ

TEST TYPE: PRELONDING

	Sequence No.	0039	0059		
	Date/Time	1260	1181N 0130		-
	Description of Event	FULL ALIKE LLANGERE LOADS CYLLE IS	ELLENDA LONDA CYCLESO		
	Dial Gages, P(1)	/	/		
	Optical Horizontal Control, P(1)	/			
DATA	Optical Vertical Control, P(1)	/	1		
	Tape Extensometer, P(1)				
AA	Tilt Meters, P(1)				
PRIMARY					
	Timber Pile Inclinometers, S(9)	/	1		
	Timber Pile Slopes, S(9)				
	Tell Tales, S(10)				
4	Surface Settlement, S(11)				
DATA	Ground Inclinometers, S(12)		PO 304		
	Sondex, S(12)				16
V	Piezometers, S(13)	V			
SECONDARY	Thermo-couples, S(14)	1	1		
SEC	Strain Gages, S(10)				
=	Record No 02		8		
	NA Record No 03	Blick Hope			

Y70825 Phase II, Voi 1 /

M.3 SUMMARY LOG OF DATA ACQUIRED LUT US

FLE SP FING, MONDER ME

ID No .: 09-02-

MONOLITHIS) TESTED: M26M6

TEST TYPE: PDET

	Sequence No.	0000	0001	0002	0104	0104
	Date/Time	1/0/19 2100	1/22 0700	1/23 1600	1/23 2135	1/25 0730
	Description of Event	DITTIALIZATION RULAXIALIOAD	FULL AXIAL AND LATERAL LOADS	FUL AXIAL AND LATERAL LOADS	PILE NO.4 ^SOFt MALE PENETRATION	PILE NO, 4 ~ 50ft HALF RENETRATION
	Dial Gages, P(1)	V	~	\		>
•	Optical Horizontal Control, P(1)	V	~	V	V	V
DATA	Optical Vertical Control, P(1)	~	/	~	~	Y
	Tape Extensometer, P(1)		✓	~	~	V
PRIMARY	Tilt Meters, P(1)		~			
	Timber Pile Inclinometers, S(9)		V			
	Timber Pile Slopes, S(9) Tell Tales, S(10)					
•	Surface Settlement, S(11)		<u> </u>			
DATA	Ground Inclingmeters, S(12)		· •			
IRY	Sondex, S(12)		V			
NO	Piezometers, S(13)		V		~	~
SECONDARY	Strain Gages, S(10)	/	'	y	· ·	
	Record No 02		4	5		
	Record No 03					

170825 1000 3. 16 TA

ID No.: 09-02-

MONOLITHIS) TESTED: MZAML

TEST TYPE: PDET

	Sequence No.	0110	0204	0204	0208	0303
	Date/Time	1/25 1155	1/26 0100	1/26 1400	1/26 1928	1/27 0050
	Description of Event	PILE NO. (~ 100ft FULTIBLE PORTION	PILE NO.Z. ~51ft INLEMENTATION	PILE NO.Z ~51ft MAFFENETRATION	PILE NO. Z ~ 96ft TULL THE BRITCH	PLENGS ~56H
	Dial Gages, P(1)	V	V	ATTENDED TO STATE OF	/	/
DATA	Optical Horizontal Control, P(1) Optical Vertical Control. P(1)	V	V	~	~	~
O		<u> </u>	~		/	_
	Tape Extensometer, P(1) Tilt Meters, P(1)	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	/		~	/
PRIMARY						
	Timber Pile Inclinometers, S(9)					~
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	V	✓		~	V
•	Surface Settlement, S(11)	V			V	
DAT	Ground Inclinometers, S(12)					
*	Sondex, S(12)					
SECONDARY	Piezometers, S(13)	V	V			~
ON	Thermo-couples, S(14)	V	V		/	
SE	Strain Gages, S(10)			V	~	1
	Record No 02			6	7	8
	Record No 03					

Y70825 Phas型, 61工A

ID No.: 09-02-MONOLITH(S) TESTED: MZLML

TEST TYPE: PDET

	Sequence No.	0306	0403	0405	0405	0503
	Date/Time	1/27 1400	1/27 1945	1/28 0140	1/29 0710	1/29 1100
	Description of Event	PILE NO. 3 ~ 95ft RILIENETRATION	PILE NO.4 ~57ft HALF PERIETRATION	PILE NO.4 ~95 ft FILL PENETRATION	PILE NO.4 ~ 95ft RULPHETRAIN	PILE NO, S ~ 57ft NULFRACIBATION
	Dial Gages, P(1)	V	~	/		~
•	Optical Horizontal Control, P(1)	V	/	V	V	✓
DATA	Optical Vertical P(1)	✓	~	~	V	>
	Tape Extensometer, P(1)	V	~	~	/	/
PRIMARY	Tilt Meters, P(1)	V				✓
	Timber Pile Inclinometers, S(9)	/				
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	/	✓	/		
¥	Surface Settlement, S(11)	/	V			V
DA	Ground Inclinometers, S(12)	V			V	
	Sondex, S(12)	V				
DA	Piezometers, S(13)	/	~	~	V	~
SECONDARY	Thermo-couples, S(14)	/	/	~	~	/
SEC	Strain Gages, S(10)	1	~	✓	×	~
	Record No 02	9	11	12		14
	Record No 03					

ID No.: 09 - 02 -

MONOLITH(S) TESTED: M21H6

TEST TYPE: PDET

	Sequence No.	0504	0605	0607	0705	0709
	Date/Time	1/29 1700	1/30 0100	1/30 0840	1/30 ZI30	1/31 1300
	Description of Event	PILE NO.5 ~96ft RULIBLETERTION	PILE NO. 6 ~ 56ft METRIETEMEN	PILE NO. 6 ~ 95ft - NULTHETONION	PILE NO.7 ~57Ht NUT POLEMEN	PHE NO.7 ~95# FOLL POSEBATION
	Dial Gages, P(1)	/	/	\	· 🗸	>
•	Optical Horizontal Control, P(1)	/	✓	/		
DATA	Optical Vertical P(1)	/	/	1	✓	
RYD	Tape Extensometer, P(1)	/	/	1	/	/
PRIMAR	Tilt Meters, P(1)	V	✓	1	/	/
	Timber Pile		***************************************			
	Inclinometers, S(9)			/		
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	/	/	/	/	
4	Surface Settlement, S(11)	/	/	/	✓	
DAT	Ground Inclinometers, S(12)					
A	Sondex, S(12)					
DA	Piezometers, S(13)	/	/		~	
SECONDARY	Thermo-couples, S(14)	/	V	~	/	
SEC	Strain Gages, \$(10)	V	V	~	/	/
	Record No 02	15	16	53	54	55
	Record No 03					

Note: / = Complete set of readings taken

ID No.: 09 - 02 -

MONOLITHIS) TESTED: MZ LML

TEST TYPE: PDET

	Sequence No.	0803	0806	0903	0907	1003
	Date/Time	1/31 1735	1/31 2345	2/1 1830	2/1 2310	2/1 0225
	Description of Event	PILE NO.8 ~47ft HUF PENETRATION	PILE NO.8 ~ 94 ft FULTENETINTION	PILE NO.9 ~ 47ft HALF TOWER PATION	PILENO.9 ~95ft religioneration	PILENO. 10 ~ 51 H HALF PENETRATION
	Dial Gages, P(1)		/	/	/	V
•	Optical Horizontal Control, P(1)	✓	~	/	/	
DAT	Optical Vertical P(1)	/	~	V	~	/
	Tape Extensometer, P(1)	/	~	/	~	V
PRIMARY	Tilt Meters, P(1)	~	✓	~	~	✓
٩						
	Timber Pile Inclinometers, S(9)		/			
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	V	/	V	/	
4	Surface Settlement, S(11)		V			
DAT	Ground Inclinometers, S(12)					
_	Sondex, S(12)					
DA	Piezometers, S(13)	V	/	1	~	1
SECONDARY	Thermo-couples, S(14)	V	/	1	/	~
SEC	Strain Gages, S(10)	/		/	~	/
	Record No 02	56	57	58	60	61
	Record No 03					

Note: / = Complete set of readings taken

170851 100001; WI = A

ID No.: 09-02 MONOLITH(S) TESTED: MZ&H6

TEST TYPE: PDET

	Sequence No.	1003	1005	1202	1300	1302
	Date/Time	z/z 0900	2/2 1230	2/3 0110	2/3 0730	2/3 1530
	Description of Event	PILE NO. 10 ~51ft HUF TENETERTION	PILE NO. 10 ~ 9544 FOLLRENETRATEN	PILENO.12 ^ 53ft RUL PENETRATIN	PILE NO. 13 START	PILE NO. 13 ~51 ft FULTHERLATION
	Dial Gages, P(1)		/	/		
4	Optical Horizontal Control, P(1)	V	/	✓	~	/
ATA	Optical Vertical P(1)	V	/	1	/	~
RYD	Tape Extensometer, P(1)		V	V	/	~
RIMAR	Tilt Meters, P(1)		~		/	
PR	0					
	Timber Pile Inclinometers, S(9)	1				
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)		/	~	1	1
4	Surface Settlement, S(11)		/		1	/
DAT	Ground Inclinometers, S(12)		/		1	
7	Sondex, S(12)					
DA	Piezometers, S(13)		V		1	1
SECONDARY	Thermo-couples, S(14)		V	/	/	1
SEC	Strain Gages, S(10)		~	~	~	/
	Record No 02		62 ONI	4 10012	5	6
	Record No 03					

77721 11 - 2, 16 = 1

ID No.: 09-02-

MONOLITHIS) TESTED: MZAML

TEST TYPE: PDET

	Sequence No.	1404	1408			
	Date/Time	2/3 2000	2/4 0030			
	Description of Event	PILE NO 14 ~51ft RULINETITY ION	TOLL AXIAL LOADS			
ARY DATA	Dial Gages, P(1)	V		7.343		
	Optical Horizontal Control, P(1) Optical Vertical Control. P(1)	J	V			
		Y .	· · /			
	Tape Extensometer, P(1) Tilt Meters, P(1)	-			-	
PRIMARY						
SECONDARY DATA	Timber Pile Inclinometers, S(9)					
	Timber Pile Slopes, S(9)				1	
	Tell Tales, S(10)	1	1			
	Surface Settlement, S(11)	1				
	Ground Inclinometers, S(12)					
	Sondex, S(12)					
	Piezameters, S(13)	/	/			
	Thermo-couples, S(14)	V				
	Strain Gages, S(10)	V	7			
	Record No 02	7	8			
	Record No 03					

17721 HE A

M.4 SUMMARY LOG OF DATA ACQUIPED DURING

LATERAL LOAD TESTING, MONOLITH ME

ID No.: 10-02MONOLITH(S) TESTED: M2

TEST TYPE: LOAD TEST

	Sequence No.	0000	0003	0006	0009	0010
	Date/Time	2/5/11 1030	21/1 2200	2/6/14 0010	ALIM DES	alfa Aco
	Description of Event	FUL ATIAL LOAD, NO LATERLUAD INITIALIE	ADOT AVAIL BEOLATER LOADS	FUL AXIAL IVE = 2400) Zeto LAMBE LOAD	FULL ARIAL 486 (Mg.) LAMBRICATS	TULL MINE 72 & LABOR LONDS
	Dial Gages, P(1)	/				/
	Optical Horizontal Control, P(1)	1	~		/	/
ATA	Optical Vertical P(1)	V	V	V	V	
Y D	Tape Extensometer, P(1)	1	1	1	/	1
PRIMAR	Tilt Meters, P(1)	1			1	
	Timber Pile Inclinometers, S(9)	/			/	7
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)		~	1	1	V
•	Surface Settlement, S(11)	/	/		-	/
DAT	Ground Inclinameters, S(12)	/			1	
	Sondex, S(12)		(P0804)			
DA	Piezameters, S(13)	1	1	1	1	1
SECONDARY	Thermo-couples, S(14)		/	1		1
SEC	Strain Gages, S(10)	/	/			
	Record No 02	4	5,6	7	8	9
	N/A Record No 03					

Note: / = Complete set of readings taken

YTC815
Phase IN Vol I A

ID No.: 10-02
MONOLITH(S) TESTED: M2

TEST TYPE: LOND TEST

	Sequence No.	0011	0014	0017	0021	
	Date/Time	2/1/11 1130	यशीम ।इक	1/4/11 0230	2/12/19 0845	
	Description of Event	THE MINE THE LAMBRE LONGS	FULL MINL 120t LAMENL LOACE	THE AKING HATE LOADS	Fully UNION	
	Dial Gages, P(1)	/	(partial)	(contral)		
	Optical Horizontal Control, P(1)	1	1	1	1	
DATA	Optical Vertical Control	/	/	/		
	Tape Extensometer, P(1)	/	/			
PRIMARY	Tilt Meters, P(1)					
	Timber Pile Inclinameters, S(9)	/	V			
	Timber Pile Slapes, S(9)					
	Tell Tales, S(10)	~	~			
ATA	Surface Settlement, S(11)	/				
DA	Ground Inclinameters, S(12)	/			/	
	Sondex, S(12)					
DA	Piezameters, S(13)	/				
SECONDARY	Thermo-couples, S(14)	1	1			
SEC	Strain Gages, S(10)					
	Record No 02	10	11	12,13,14	15 (m 2/t)	
	NA Record No 03					

Note: / = Complete set of readings taken

Y7C-825 Fhace I ; YOL II A

M.6 COMPLETE DRIVING RECORDS OF PROTOTYPE PILES
DRIVEN WITH IMPACT HAMMERS, MONOLITH M2

The driving records are presented in chronological order of driving for prototype piles No. 1 through 6, driven with a VULCAN 010 hammer and prototype piles No. 7,8, 13,14, driven with a MKT DE 70B hammer.

I.D. No. 2 1 02 190 0 0100 Date 23.44."

First 23 JAN 79 0101
Finish 25 JAN 70

50 ft M2

A Maximum Transmitted Energy, Emax K-Ft O Blow Count, bijet Depth 47 15 20 74 43

O Maximum Driving Force , Fmax , Kips

WCL, YTC825, Phase IV ; Vol II A

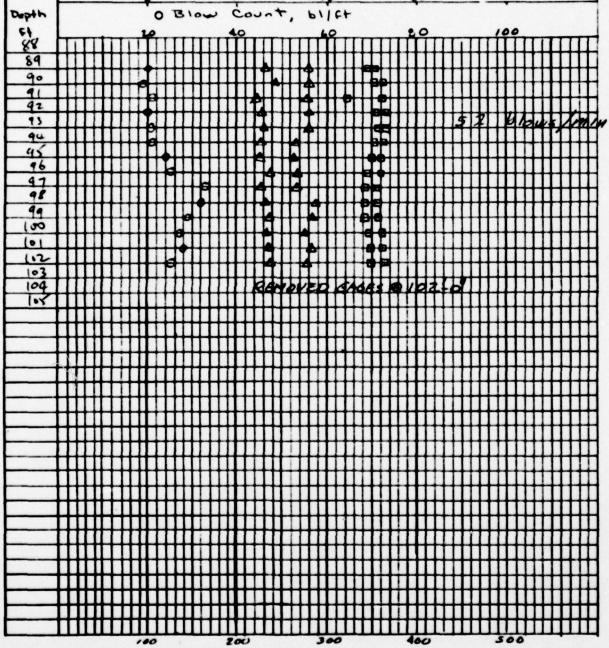
Time Sequence No

1	A Maximum Transmitted Energy, Emas K-Ft s	
Depth	O Blow Count, bijft	
44	10 40 40 100 100	
49		***
50		\mathbf{H}
51		
52	28 88 > 4 24 88 88 88 8 8 8 8 8 8 9 8 9 8 9 8 9 8 9	++++++
53		
54		+++++
55		411/444
56	88 × 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	+++++
57		шш
58		
59		
60		+++++
61	<u> </u>	
62	<u> </u>	ШШ
63	8)	$\mathbf{H}\mathbf{H}\mathbf{H}$
64	i) (1 548 849 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	\mathbf{H}
65	T) 41 F \$ 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	11/4/1
66	<u> </u>	$\Pi\Pi\Pi\Pi$
67	<u> </u>	ШШ
68	<u> </u>	ШШ
69	1141222102102020202020202020202020202020	ШШ
70	<u> </u>	ШШШ
7/	<u> </u>	ШШ
72	111) 4111 1111 1111 111 111 111 111 111	\mathbf{H}
73	<u> </u>	ШШ
79	<u> </u>	444
75	<u> </u>	
76	<u> </u>	
77		
78	<u> </u>	
79	<u> </u>	
60		
8/		
82		
83	<u> </u>	
89		THENE
85		
86		
87		
-11		

O Maximum Driving Force , Fman , Kips

WCL, YTCBES, Phase II ; VOL TA

		CONSULT					M-24	
FOCES	AND DA	w wo. sc		I.D. No.	27 2.	120 3	3/30	-
PILE	DISINING	EFFECT	5 TEST			Da.	T.	-
		MEASURE		F.Ol	Time	ceque	nce No	_
	Δ	Maximum	n Transmi	ted Energy		. K-E+		-
	Δ			tted Energ	-	K-E+	s	-
Depth	Δ	\$		tted Energy	-		s	_
13	Δ	\$	/Þ	tted Energy	-			
88		\$	/Þ	Hed Energy bilet	10			
51 88 89		\$	/Þ	Hed Energy bilet	10			
89 90		\$	/Þ	Hed Energy bilet	10			
89 90		\$	/Þ	Hed Energy bilet	10			
89 90	<u> </u>	\$	/Þ	Hed Energy bilet	10			



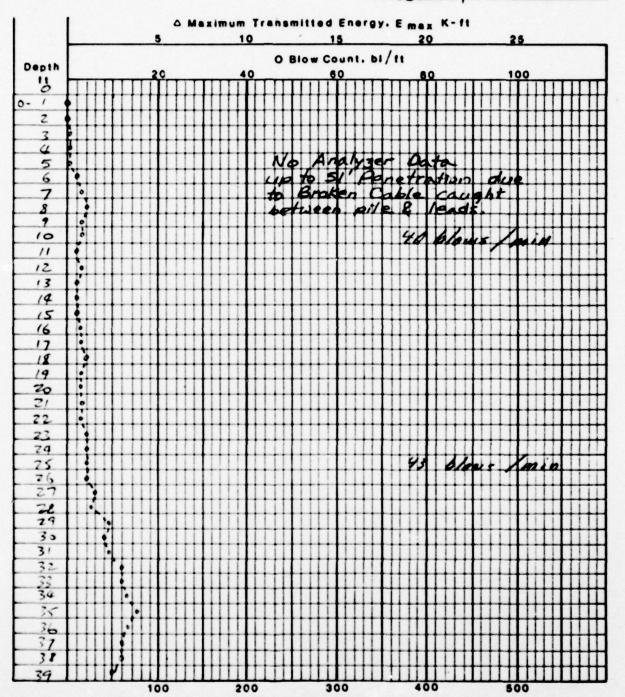
WCC, YTCBES, Phase II ; Vol IIA

I.D. No. 09 02 180 0 0200

Operator LEE SEK

PILE DRIVING MEASUREMENTS
PILE NO. _ _ _ _ _ _ _

First 19:12 OZO1
Finish ZCAN 79 OZO8



Maximum Driving Force, Fmax. Kips

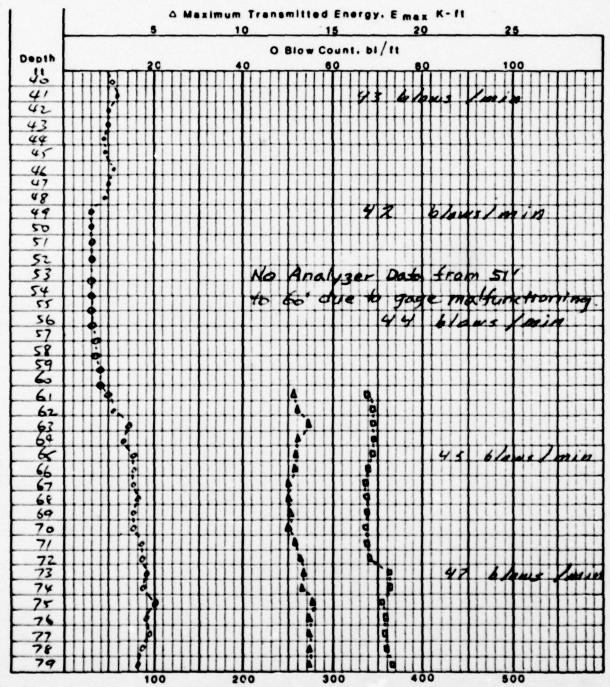
WCC. Y7C825. Phase II , Vel IA

1.D. No. 09 02 180 0 0200

Operator SEX

PILE DRIVING MEASUREMENTS PILE NO. 02 Time Sequence No.

First _____



O Maximum Driving Force. Fmax. Kips

WCC. Y7C825. Phase IV; WL WA

1.D. No. 09 02 180 0 0200

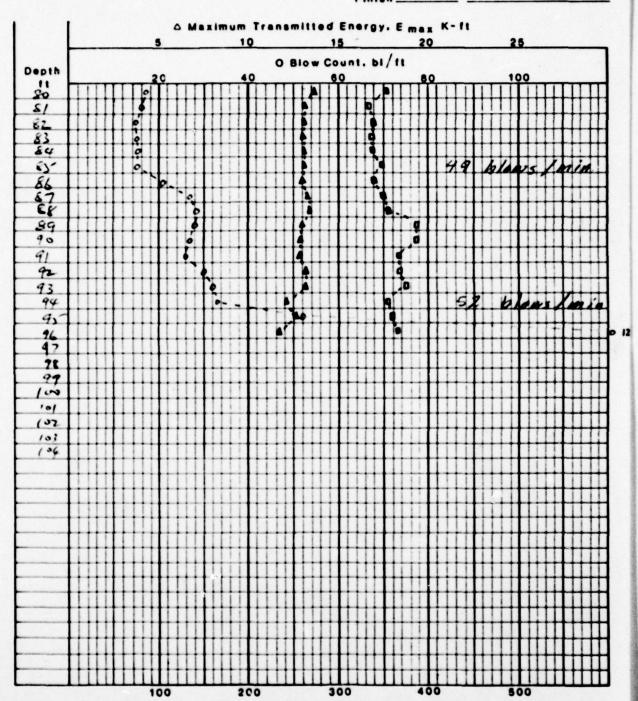
Time

Date 1/25/79

Operator_SEK Sequence No.

PILE DRIVING MEASUREMENTS PILE NO. _ 02_

First _____

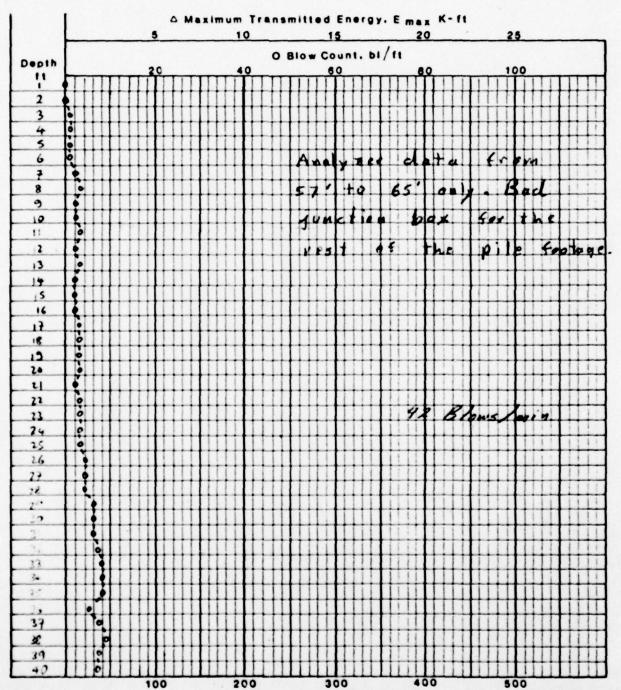


O Maximum Driving Force. Fmag. Kips

WCC. Y7C825. Phase IT; VOL TA

Date 97 Sec Composition of the Sec Compositio

PILE DRIVING MEASUREMENTS PILE NO. 03___ Time Sequence No.



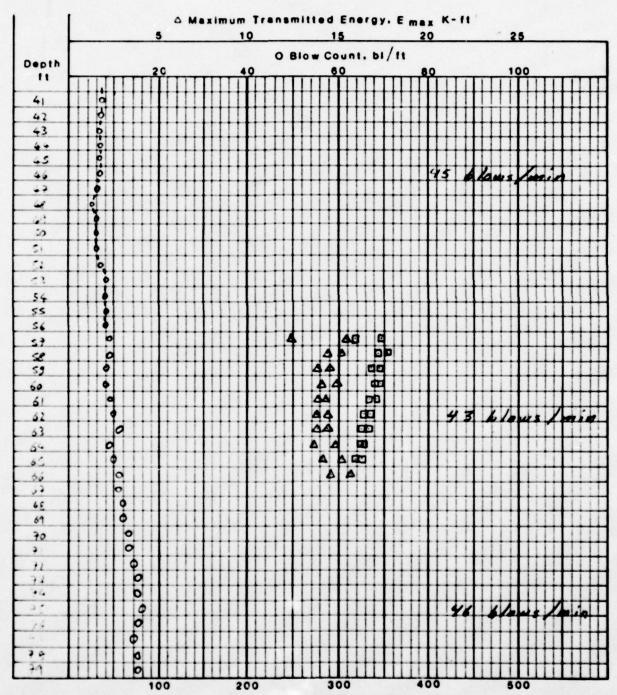
O Maximum Driving Force, Fmax. Kips

WCC. Y7C825. Phase IV 3 VOL IA

1.D. No. 09 02 180 : 2300 Date 1/27/79 Operator 55K

PILE DRIVING MEASUREMENTS
PILE NO. _03___

First ______ Finish _____



WCC. Y7C825, Phase IV, Vol IA

I.D. No. 09 27 180 0000 Date 1/27/29

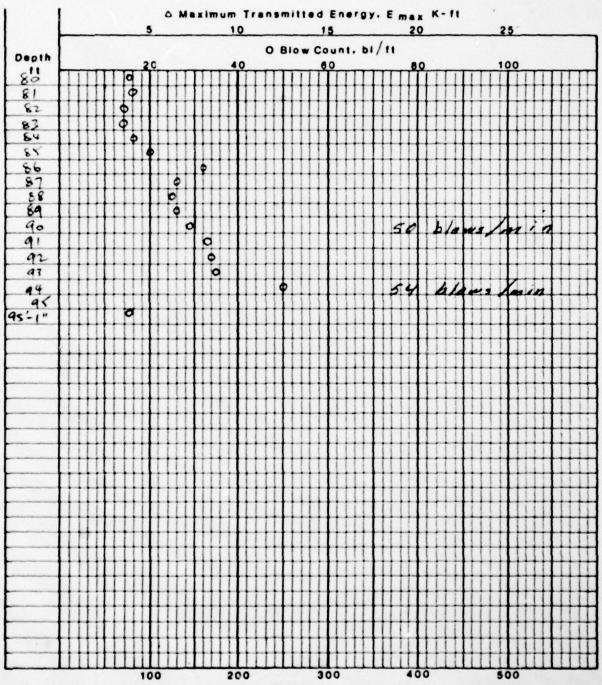
Operator FEX

Sequence No.

PILE DRIVING MEASUREMENTS PILE NO. __03__

First _____

Time



D Maximum Driving Force, Fmax. Kips

WCC. YTC825. Phase IV; Vol TA

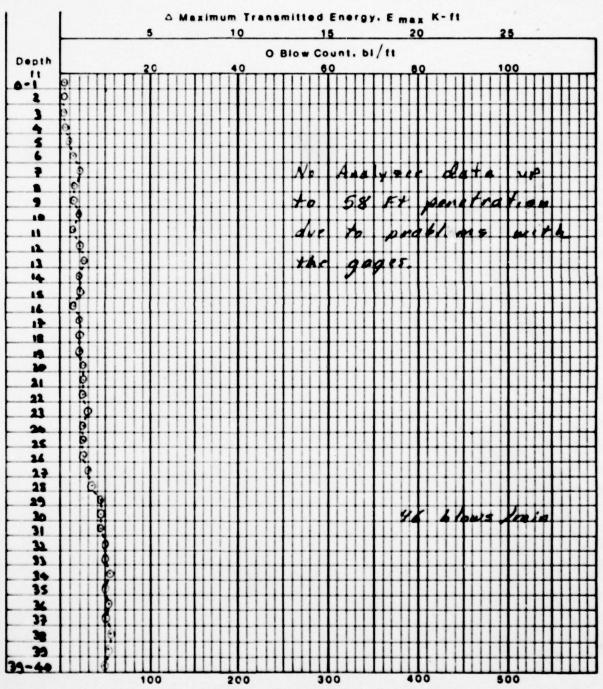
I.D. No. 05 02 180 0 0400

Operator SEK

PILE DRIVING MEASUREMENTS
PILE NO. 4

First 18:55 0401

Finish 01:13 1/28 0405



WCC. Y7C825. Phase IV; Vol. IA

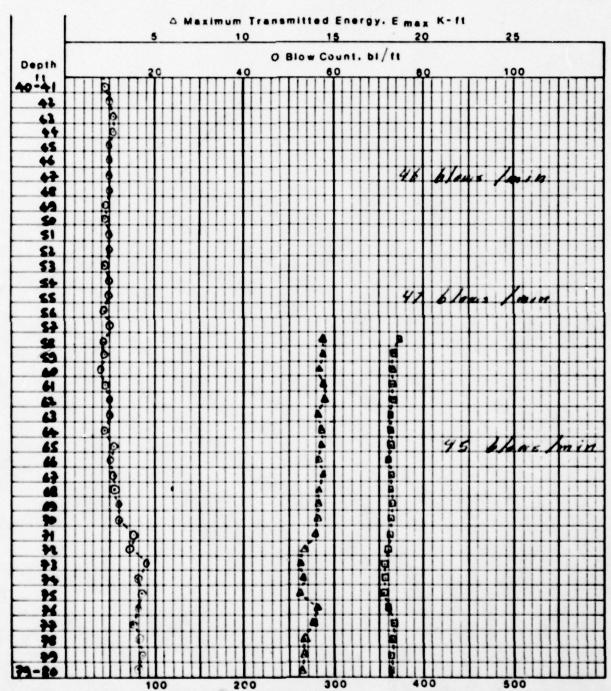
I.D. No. 09 02 180 0 0400

Time

Operator_AZ

PILE DRIVING MEASUREMENTS PILE NO. 4

Sequence No.



O Meximum Driving Force, Fmex. Kips

WCC. Y7C825. Phase IV ; Vol KA

PILE DRIVING MEASUREMENTS PILE NO. _______ I.D. No. 09 02 180 0 0600

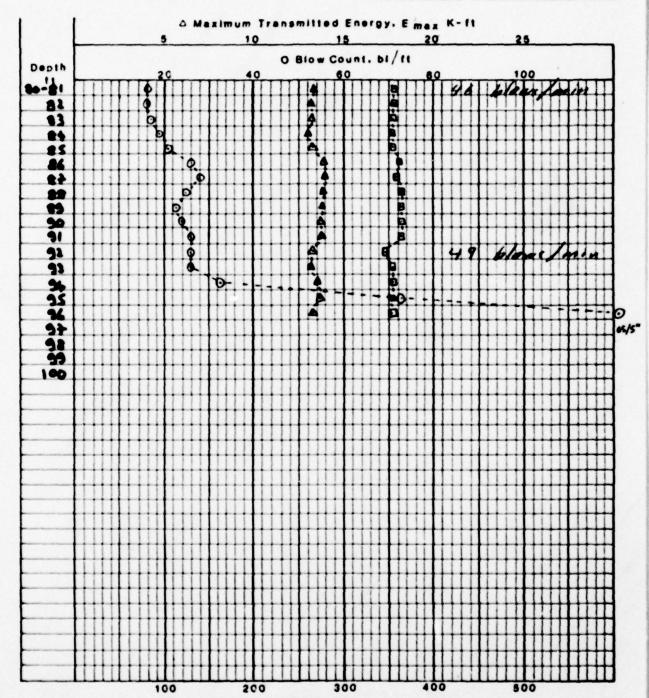
Date_1/27/19

Operator_AZ

Time

Sequence No.

First _____



O Maximum Driving Force, Fmax. Kips

WCC. Y7C825. Phase IV ; VOL BA

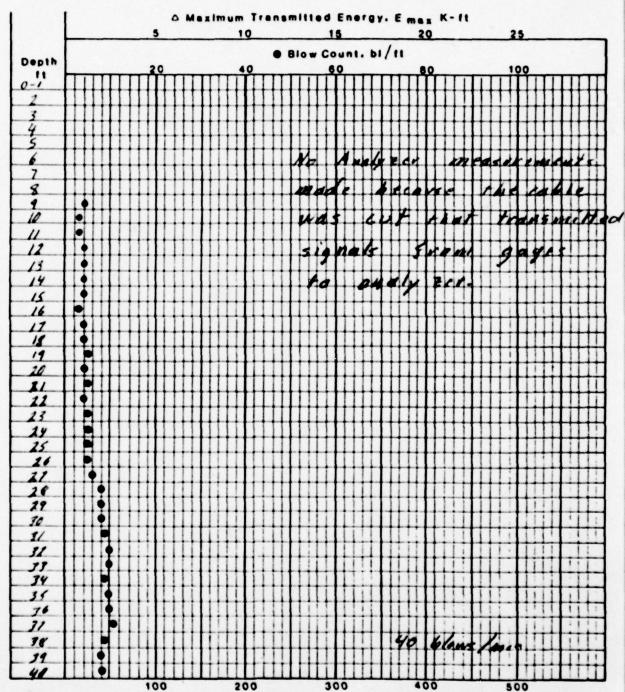
I.D. No. 09 07 180 1 0600

Operator 5/

M-34

PILE DRIVING MEASUREMENTS
PILE NO. __05__

Time Sequence No.



O Maximum Orlving Force. F mag. Kips

WCC. Y7C825. Phase 12; VOL 114

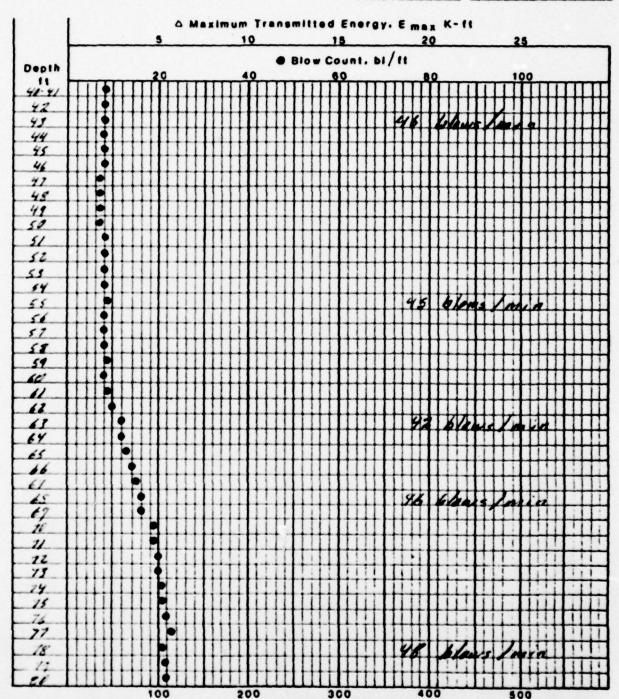
M-35

Operator SEK

Time Sequence No.

PILE DRIVING MEASUREMENTS PILE NO. _05__

First _____



O Maximum Oriving Force. F mag. Kips

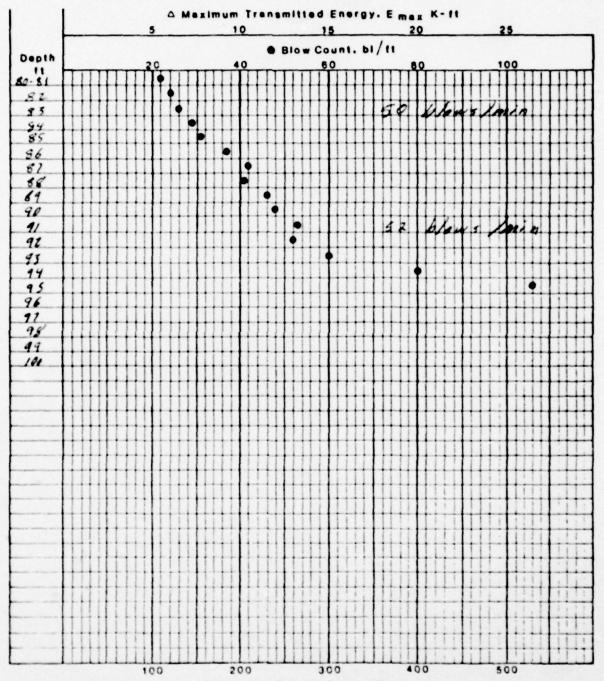
WCC. Y7C825, Phase II; VOL IA

Dete_1/24/19

Operator SEX

PILE DRIVING MEASUREMENTS
PILE NO. __05__

First _____



O Maximum Oriving Force, Fmax. Kips

WCC. Y7C825, Phase IZ Wel IA

PILE NO. 16

PILE DRIVING MEASUREMENTS

1.D. No. 07 02 130 1 0600 M37

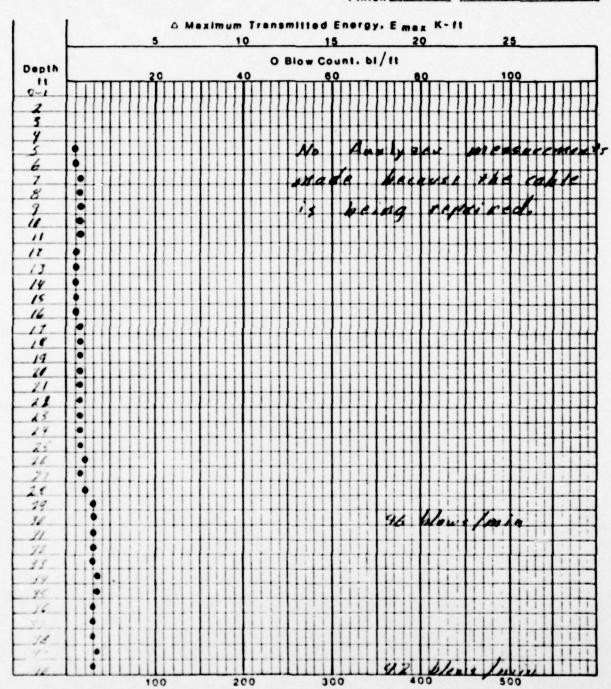
Date 1/29/17

Operator 15 4

Time

Sequence No.

Fire1_____



O Maximum Driving Force, Fmax. Kips

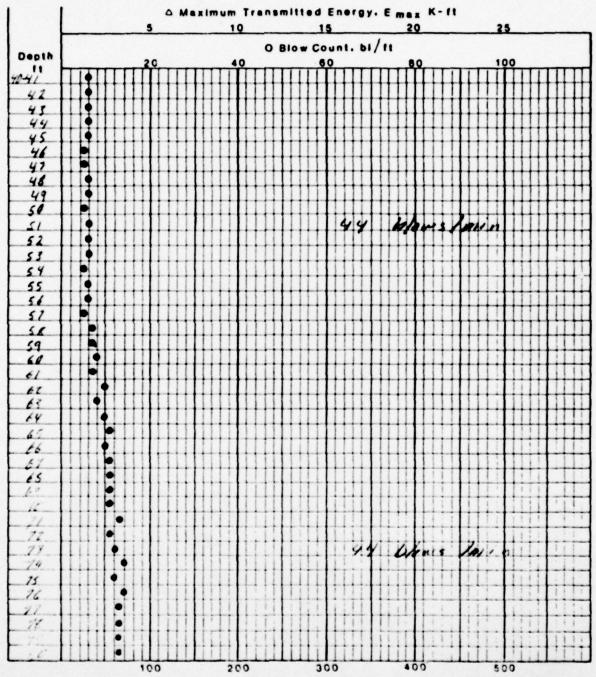
WCC. Y7C625. Phase II WOL WA

1.D. No. 09 02 150 10600

Date 4/29/25

Operator_it&

PILE DRIVING MEASUREMENTS PILE NO. _________ Time Sequence No.



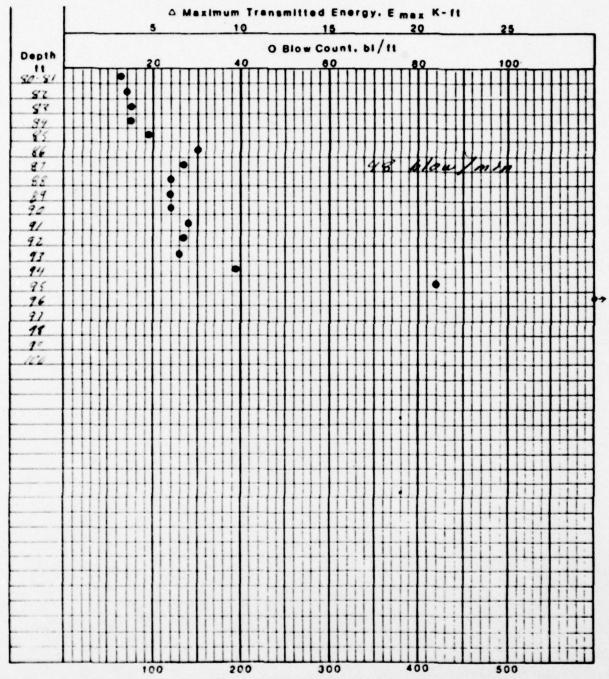
□ Maximum Driving Force, F max. Kips

WCC. Y7C625. Phase TZ ;NL IA

Dete_1/29/79

Operator TS1

PILE DRIVING MEASUREMENTS PILE NO. ___26_ Time Sequence No.

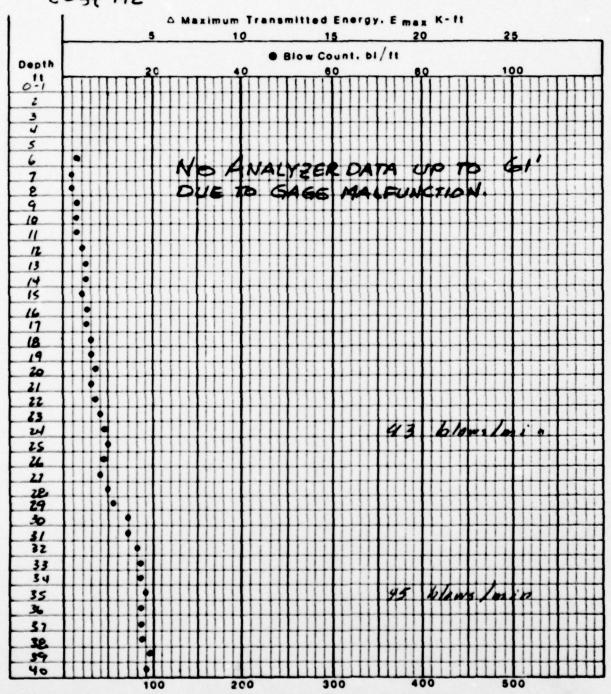


WCC. Y7C825. Phase IV; Vol. MA

Date 1/30/19

PILE DRIVING MEASUREMENTS
PILE NO. 47
25 4 MZ

First 12:46/3 407 1708



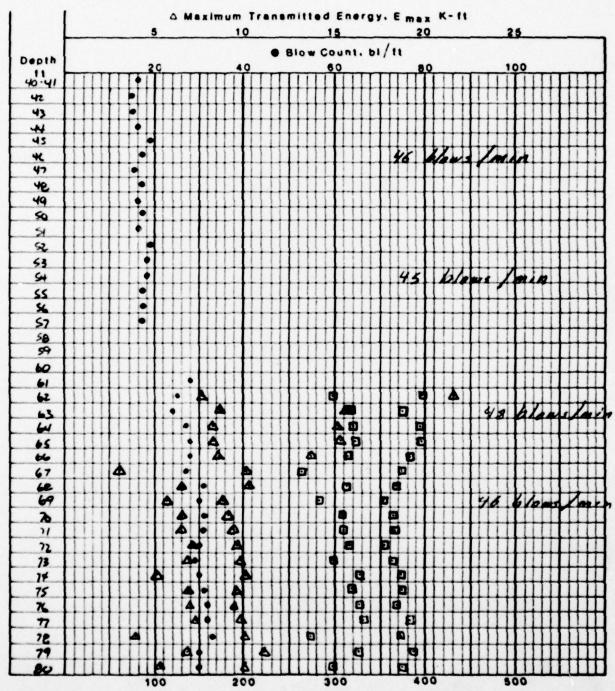
O Maximum Driving Force, Fmax. Kips

WCC. YTC825. Phase IT ; VOL TIA

1.D. No. 09/02/180/0/0700

Date 1/30-31/79
Operator 74/364

PILE DRIVING MEASUREMENTS PILE NO. \$7___ Time Sequence No.



WCC. Y7C825. Phase IV; Vol. TI A

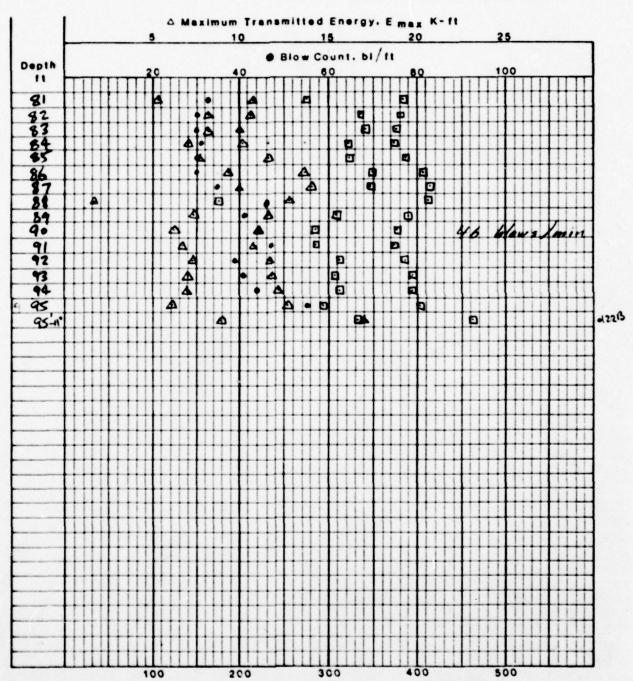
I.D. No. 09 02 180 0 0700

Date 1/3//19

Operator JL/IBH

PILE DRIVING MEASUREMENTS PILE NO. 91 Time Sequence No.

First _____



WCC. Y7C825. Phase TY ; Vol TA

1.D. No. 09 02 180 0 0800 Date 31 JAN 79
Operator JSL

trat Sequence No. O801

O Maximum Driving Force, Fmax, Kips

WCC. YTC825. Phase IV ; WL TA

1.D. No. 09 02 180 0 0800

Date_1/3//19

Operator_TSL

Sequence No.

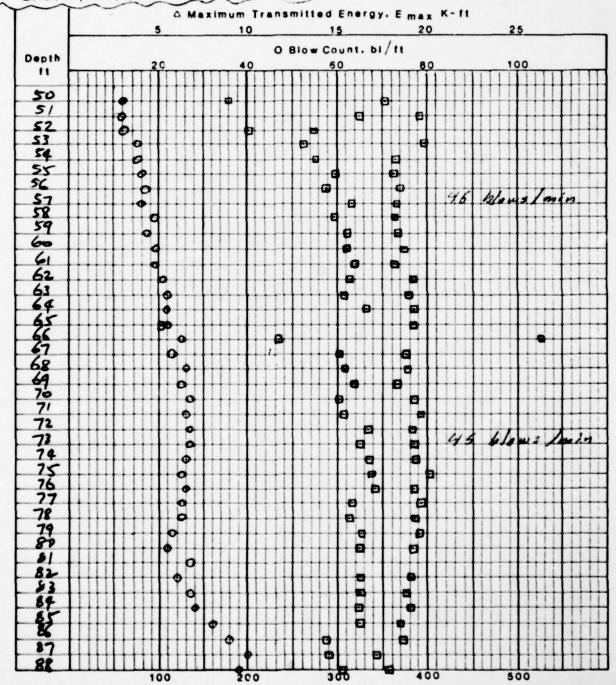
PILE DRIVING MEASUREMENTS PILE NO. __08_

First .

Time

NO ENERGY DATA FOLLOWING 48'DEP-11

Finish .



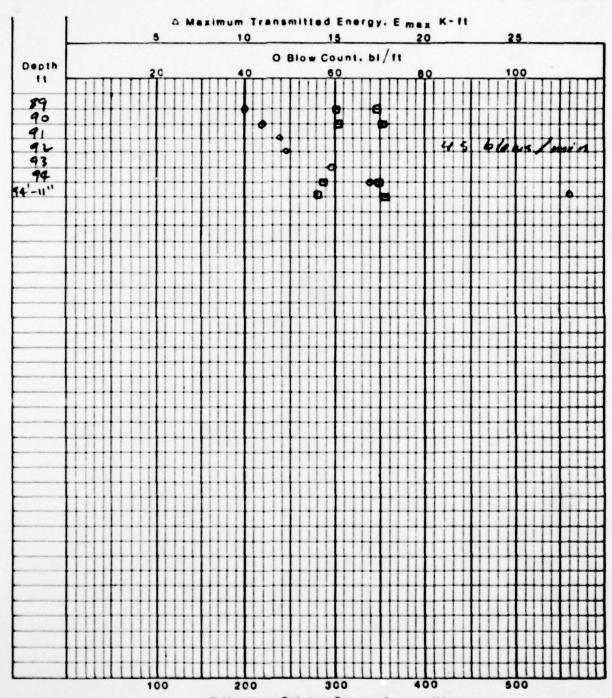
O Maximum Driving Force, Fmax. Kips

WCC. Y7C825. Phase IV SVOL TA

1.D. No. 09 02 180 0 0800 Date 1/3/1/29

Operator TSL

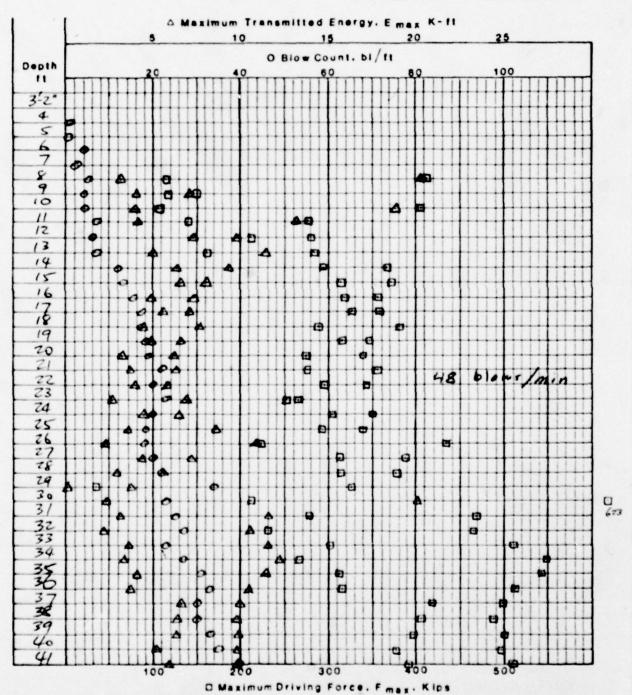
PILE DRIVING MEASUREMENTS PILE NO. _08_ Time Sequence No.



WCC, Y7C825. Phase IV; VOL IA

PILE DRIVING MEASUREMENTS PILE NO. _/3__ 1.D. No. 09 02 180 0 1300
Date 2/3/79
Operator AZ

First 14:42 1301
Finish 15:21 1302



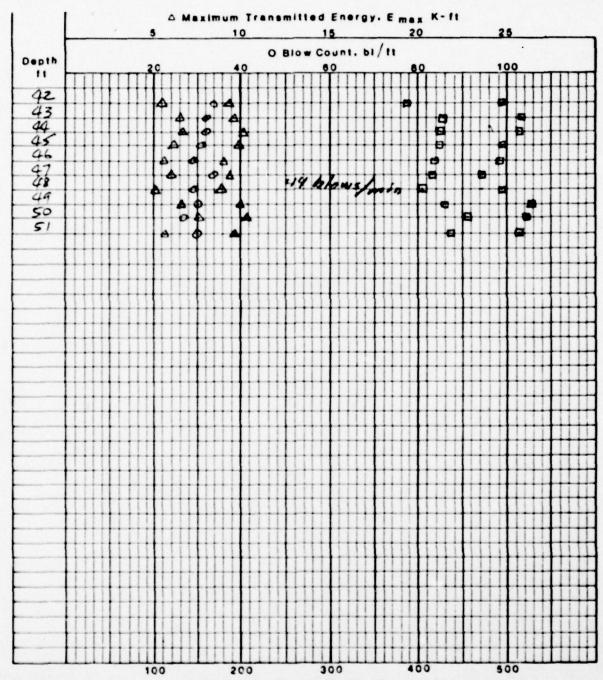
WCC. Y7C825. Phase IZ ; Vol IIA

I.D. No. 09 02 180 0 1300

Operator AE

PILE DRIVING MEASUREMENTS PILE NO. __/3__ Time Sequence No.

Finish _____



O Maximum Driving Force, Fmax. Kips

WCC. Y7C825. Phase IV; Vol I A

1.D. No 09 02 120 0 1400

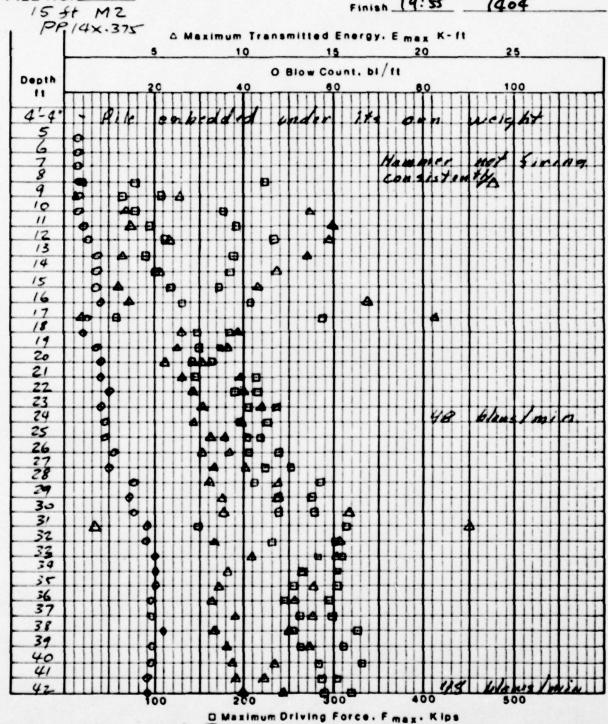
Date 3 Feb 79

Operator JSL

WCC. YTC825. Phase IV; VOL TA

First 18:57
Finish 19:55

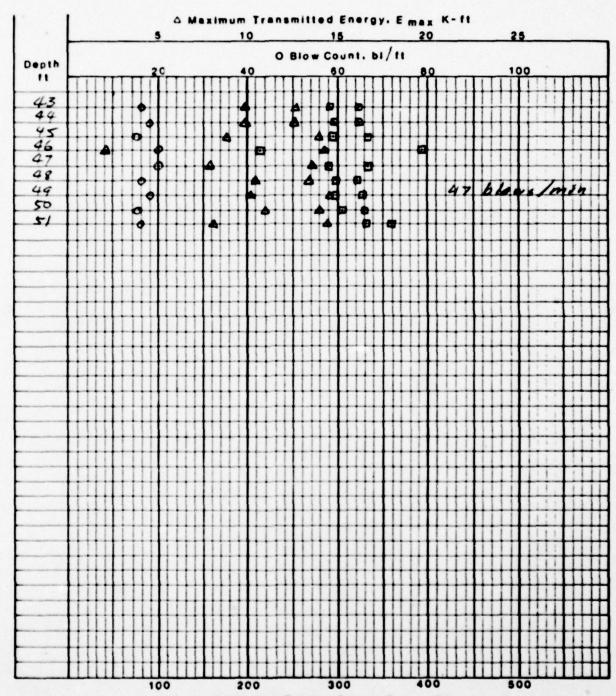
1401 (404



1.D. No. 09 02 120 6 1400 Date 2/3/79 Operator 354

Sequence No.

First_____



O Maximum Driving Force, Fmax. Kips

WCC. Y7C825. Phase IV WOL I A

Phase I WILA

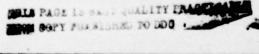
M.6 ABSOLUTE DISPLACEMENTS OF MONOLITH MS

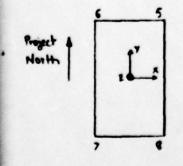
The absolute deplacements of monolith during prototype cite driving, presented in Tables M. Ia and M. E are with respect to the position of monolith, axiolly loaded and laterally unloaded before prototype pile driving.

The absolute displacements of inoralith, presented in Table M.2 are with respect to initial manulith position before preloading (no load applied); therefore, these displacement values represent total monolith displacements throughout the tests.

318	239.3	48 1	0 895
1/26/03/18			0.800
372			0 864
1186/13:57			0899
380	2388	47.6	0304
1/26/20:06			0.878
£95	239.3	480	0942
1187 /03 09			0.918
459	938.8	48.9	2000
1/27 /13:37	-		0.962
475	239.0	419	1060
1127 180 51			1021
1/28/07 01	139.3	48-1	1133
	000	101	1093
1189 /14 30	239.0	48.4	1-180
494	238 5	47.2	1-310
1/20/19 25	137.3	-115	1 261
507	238.8	48.4	1374
1/30/02:12	30.0		1.329
535	239.5	48.1	1504
1/30 /18:20			1.466
550	239.0	48.2	1.566
130 22.49		The state of the s	1353
614	238.8	45.3	1 622
1/31/13:32			1 564
623	239.8	48.3	1.670
131/1827			1601

Y-Component					Z	-Compon					
	1	•	7	6		58	,		78	7	Romarka
		0	ptical Su	TVOY DO	10						
	2		rrected								
3	0	0.748	3 747	-0.020	-0050	-0.065	+0-150	0.100	0.162	0.60 0	No meadure - it of reference
iti.	0 45	0.676	9434								beam Z displacement
61	244	0745	0757	-0.070	-0.070	0 070	0 100	0.080	0.090	0010	
36	0.757	0.699	0.700	-0.003	-0 045	-0 048	+0.057	0.033	0.085	0.018	
lei.	107.0	0.766	0.800	-0070	-0.080	-0 075	0010	0 060	0.075	0.000	
161	3.745	0-104	0.145	-0.013	-0.084	-0053	0.071	0.066	0.069	-0-010	
194	0815	0.754	0.785	-0110	-0150	-0190	0110	0.070	0000	-0015	
144	0.789	0.134	0.1153	-0116	-0.100	-0108	0.011	0.063	0077	-0016	
67	0812	0821	0559	0.130	-0110	-0120	0 090	0050		-0025	
12	0.843	0-174	0.807	-0132	-0112	-0112	0.063	0.052	0.003	-0032	
318	0316	0866	0.831								No vertical control. No load level
il le	0.867	0.805	0.836								because printer inoperable
67	0938	0940	0.750	-0 170	-0170	-0170	-0 090	0.040	-0 095	-0.098	
191	0.943	0.866	0.344	-0135	-0.169	-0175	0 043	0031	0.040	-0.068	
104	1023	.0975	0786	-0 800	-0 200	-0800	0.030	-0.010	0.010	-0 095	
94	0 986	0.946	0.743	-0 217	-0114	-0 206	0.008	0.000	0004	-0.101	
153	1083	1.035	1043	-0 240	-0.860	-0 250	0 000	-0 060	-0 030	-0.140	
165	1020	0.139	0 972	-0955	-0843	-0249	-0 006	-0015	-0.011	-0.130	
00	1-119	1.063	1088	-0 270	-0960	-0 265	0.000	-0040	-0020	-0143	
380	1.057	0.181	1.023	-0 179	-0.859	-0 265	0 001	-0 009	-0.004	-0135	
75	1263	1.197	1-192	-0340	-0340	-0.340	-0060	-0090	-0075	-0.208	
06	1179	1.108	1 12.1	-0 363	-0337	-0350	-0.057	-0.066	-0061	-0206	
28	1302	1245	1.233	-0 410	-0400	-0 405	-0 070	-0 120	-0 015	-0 250	
31	1.241	1172	1.170	-0 411	-0.402	-0.406	-0 064	-0.074		-0238	
43	1397	1363	1 355	-0480	-0500	-0 490	-0 120	-0190	-0 155	-0323	
181	1.323	1.251	1279	-0 512	-0.492	-0.502	-0131	-0142	-0 140	-0 321	
21	1473	1.415	1.422	-0530	-0 550	-0 540	-0 120	-0190	-0 155	-0 348	
52	1 372	1867	1330	-0547	-0533	-0.540	-0.146	-0.160	-0.153	-0 346	
56	1.584	1.525	1542	-0650	-0 650	-0 650	-0 210	-0260	-0235	-0443	
75	1.487	1 407	1.459	-0675	-0.648		-0833	-0 238	-0235	-0448	
35	1.694	1.627	1.631	-0690	-0.710	-0.700	-0.230	-0 290		-0480	
357	1, 5.78	1.648	1.447	-0.699	-0.685	-0612	-0 286	-0.273	-0279		
96	1.730	1679	1.682	-0 780	-0.770	-0775	-0 260	-0 340	-0300	-0538	
20	1635	1.508	1.584	-0750	-0.727	-0740		-0303	and the same of th	-0.526	
27	1.798	1731	1735	-0.780	-0.800	-0710		-0 340			
31	1688	1.615	1.634	-0.786	-0771	-0 T18	And in concession with the last of the las		-0 328	CONTRACTOR OF THE PERSON NAMED IN COLUMN 2 IS NOT THE OWNER.	
22	1.831	1782	1.710	-0.870	-0.880	-0 375	-0 320	-0390	-0.355	-0.615	
721	1.7-12	1.681	1.79.0	-0 899	-0.319	-0.856		-0378	-0 367	-0.626	
											A PAGE IS SAIL SHALLTY FRANCISCA





ABSOLUTE DISPLACEMENTS
OF MONOLITH M2

DURING PROTOTYPE PILE DRIVING

FOURDATION MUTETING AND TEST PROCRAM
ESISTING LOCAS AND DAM No. DO
OT LOUIS DISTRICT. COAPS OF CHOMOSTIC.

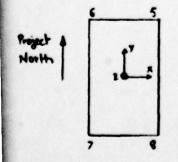
DASEGAD-TO-C-COOS

Westers Comments

Table M.le

9307	79.1	936.3	181	2085	2 139	2115	2.058	2.110
9/1/13:10	2 09 00 33			P/0 ?	9.051	1.058	1965	5.013
1003	-18.8	138.5	1, 2, 4	2 129	2.257	2 269	8 140	2.199
212/02 - 0	2/02/03/36			: 081	6.11-1	2 520	2 300	2.072
5003	789	238.2	49.5	1.188	8 313	2.366	9998	2.5.74
2/2/11/00	F2.11/2012			9 106	* [41]	2 2 2 8	2.094	2.149
1005	4,	240.0	48.4	2390	2 450	2 454	2343	2.392
2/2/12/30	2 09 14 91			2.967	2.286	2.333	2 223	2.877
1200	10	237.0	478			2 526	2.3.85	
2/2/19 30	2/02/19:41					5.915	2.284	
1209	20	231.5	48.3	9.415	9.541	2 566	2.461	2.496
2/3/02/10	2/03/01/57			8 337	2.356	2.423	2.307	2 356
2 3/07 30	74	231.8	48.7	9487	2.556	2.572	2.459	2.498
2/3/07 30	2/03/14/41			2323	2.342	2.413	2.311	2.347
1302	80	231.3	482	2.467	9 610	2.652	2.543	2.568
2/3/17/30	2 03/18:05			8 458	2.445	2.481	2.375	2.432
1404	32.	238.8	47.7	2.613	2.788	2.833	2.693	2.732
2/3/20 35	2/03/21:00			2591	2.612	2.664	2.550	2.604
1408	105	838.5	0.6	1.779	1.808	1.857	1.821	1.816
114/0120	2/04/02:01			1.670	1.698	1.771	1.693	1.713
		**						
		7.1.						

Compon	ent				Z.	Compon	ent ir.		M-5			
7	•	7	•	•	52	7		78	Z	Remarks		
Optical St Corrected		CAPOL DO	10									
1870	1225	1349	-0 920	-0.150	-0.935	-0 340	-0410	-0.375	-0.455			
1 214	1.738	1.732	-0935	-0/104	-0719	-0 361	-0383	-0372	-0.646			
2 115	2.058	9.110	-1180	-1.160	-1.170	-0460	-0580	-0.520	-0845			
5.058	1.965	5 00 3	-1180	-1.131	-1156	-0503	-0.555	-0 527	-0848			
9 969	9 140	2.199	-1.230	-1.210	-1.880	-0.500	-0620	-0560	-0.810			
2 366	2 9 9 8	2.574	-1.260	-1178	-1.209	-0.548	-0.588	-0.565	-0.887			
2 2 9 8	2.094	2 14 2	-1235	-1182	-1.209	0.500	-0.620	-0.567	-0.862			
2 454	2343	2.392	-1.600	-1.310	-1.395	-0.540	-0.680	-0.610	-1.003			
9.353	2 283	9.977	-1.357	- 1.530	-1353	-0573	-0.634	-0.604	-0 963			
2.526	2.385									Noteading 5 of 75, 76		
5.815	2.884									No vertical survey.		
2 566	2.461	2.496	-1450	-1.420	-1.435	-0.610			-1.050			
2.423	2.307	2 356		-1.438					-1.048			
9 5 19	2.459	8.498	-1640	-1.420	THE RESERVE AND THE PERSON NAMED IN	THE REAL PROPERTY AND PERSONS ASSESSED.			-1.050			
2.413	2.311	2.568	-1.530	-1.490	-1.421 -1.510	-0618		-0.647	-1.034			
2.481	9.375	9.439	1469	-1.400				-0.647	-1.095			
2.833	2 693	2.732	-1.570			-0.610		-0.690				
2 664	2.550	2.604	-1.527		-1.482				-1.076			
1.857	1.821	1.816	-1410	-1430	-1.460	-0.740				After removal of lateral load		
1.771	1.693	1.713	-1.454	-1.371	-1412	-0.772	-0.842	- 0 807	-1.110			
			-									
			 									
			1									
			-									
			-	-								
		alama i										
			1									



ABSOLUTE DISPLACEMENTS

OF MONOLITH M2

DURING PROTOTYPE PILE DRIVING

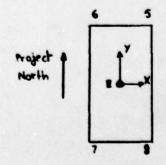
POURDATION INVESTIGATION AND TEST PROGRAM
ERISTING LOCKE AND DAM IN. SS
OT LOUIS DISTRICT, CORPS OF EMORISORS.
DACES-70-2-0005



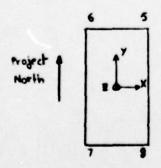
Redward-Clyde Consultants

Table M.I b

		Hos	contal d	splacement	,in.		
Displacements	5	6	7	8	Average	5	1
					eference pour		eler i
at the end of preloading (monolith only laterally	0.467	0.464	0.428	0.441	0.450	0.220	0
unloaded)	0 485	0428	0.482	0.555	0.488	0.176	0
prior to prototype pile driving (monolith axially and	1.209	1.253	1.222	1.183	1.217	0.300	
laterally loaded)	1.214	1.174	1.245	1.251	1.221	0.228	0
at the end of prototype pile driving	3.080	3 25 2	3.261	3.134	3.182	1.790	1
(mondith axially and laterally loaded)	3 076	3.040	3 146	3.105	3.092	1.703	
prior to load testing (monolith axially loaded and	2.178	2.214	2.253	2.158	2.211	1.700	1
laterally unloaded)	2.175	2.126	2 252	2.248	2.201	1.630	



tol di	splacement	,in.			Settlemer	it , in.			
7	8	Average	5	6	North Awrage	7	8	South A wrage	Average
		firence pointed linear		der dota					·
.428	0.441	0.450	0.220	0.170	0.195	0.100	0.170	0.135	0.165
.482	0.555	0488	0.176	0.083	0.132	0.114	0.150	0.132	0.132
.222	1.183	1.217	0.300	0.220	0 260	- 0.050	0.070	0.010	0.135
. 245	1251	1.221	0.228	0.133	0.180	0.023	0.010	0.050	0.115
.261	3.134	3.182	1.790	1.670	1.730	0.710	0.940	0.825	1.278
146	3.105	3 092	1.703	1.525	1.614	0.744	0.859	0.802	1. 208
.253	2.138	2.211	1.700	1.530	1.645	0.850	1.070	0.960	1.303
252	2 248	2.201	1.630	1.460	1.544	0.889	1000	0.945	1.244



PILE DRIVING EFFECTS TEST PROGRAM

ABSOLUTE DISPLACEMENTS

OF MONOLITH M &

FOUNDATION INVESTIGATION AND TEST PROGNAD EXISTING LOCAS AND DAW No. 20
OT LOUIS DISTRICT. CORPS OF ENGINEERS.

DAGM-3-70-2-5003

Weedmard Clyde Consults

Table M. 1

2

Y7C·825 Phase Ī∑; VOL TII A

M.7 INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR PROTOTYPE PILES OF MONOLITH M2

Monoliths M216 Prototype Pile No. 1 Pile Type 4P 14x73

	No .	0	101		0	102		0	10.	;	0	10	•		010		0	10	6	0	10	7		108			010	9	CI	10	
Pile Pene	tre tien	1	10. 1		1	201		3	3		4	60			51			60			70		8	30			90		10	07	_
Election !	5-11	300	1	4	90	7		0.0	Teat	4	040	1	1	000	T		Owe	1	1	90	-	5	0.0	T		0.00	-	1	000	I.	
1	m) i		V			V			V			V			V			V			V			V			V			V.	
	012-1		Y	X		V	X		V	X		V	X		V	X		V	X		V	×		V	X		V	X		V	×
1	M2		_																											_	
1	6-1-15																													-	
1:	m3																														
	612.50																														
- 7	F 3			X			X			X			×			X			X			X			X			X		1	×
	65:30		X			×			×			×	1		X			×			×			×			X			X	
1.	f.s			X			X			×			×			X			X			X			X			X			×
110	65-15		X			X			×			X			X			X			X			×			x			X	
111	F4			X			×			X			×			Y.			×			X			×			X			X
1	65-1(F2)		IX.			×			X			×	1		X			X			X			×			X			X	
1.,	911-1		X			×			×			X			X			X			×			X			×			X	
114	64-1(FI)																														
1.1	011-15																														
110	64-15																														
/ 17	411-60																														
1,0	64-50																														

Monoliths M2/6, Prototype Pile No.2. Pile Type HP 14x73 Fund Pile Penetration 96 ft

	N.		20	,	0	20	2	0	20.	3	0	20	4	0	zas	-	c.	206		0	20	7	0	20	8		-1	•			
Pile Per			5			20	,		3	•	-	16			51			60			75			90			76				
Elan.	٠٠٠٠٠	300	I	4	0:0	I	3	0.0	Ī	5	000	1	1	20	I	:	300	I	4	0.0	-	3	00	ī	4	0.00	1		000	1	
,	mı.		Y.	X		V			V			IV.			V			V			V			Y.		_		_			
•	611-1		V	X		V	X		V	×		V	X		V	×		V	X		V	X	_	V	×		_	-		-	
1	nz_	-	_	_	-	_	_	-	-	-	-	-	_	-	-							_	_	-	-		_	1			
-	612-15	-	-	-	-	-	-	-	-	-	-	-	-	_	-	_	_	_	_	_	_	-	-	-	_	_	-	_		_	_
	P.3	-	-	_	_	-	-	-	-	-	-	-	ļ.,,	-	-	_	_	_	_	_		-	-	-	-		_	1	-	-	-
	411.50	1	_	-	_	-	-	_	-	-	_	-	-	_	-	_	_	_	-	-	_	-	-	-	-	_	_	-	-		-
7	F3	-	-	X	_	-	×	1	-	X	-	1.	X	-	١.,	X			X	_	-	X	-		X	_	-	-	-	_	-
	63-50	-	X		_	X	-	-	X.	-	_	×			X	· continued		1	· · · · · · · · · · · · · · · · · · ·		X	1	-	×	-	_	-	-	-	-	-
•	FS	-		X	-	1	X	-	-	X	-	1	X	-	×	X			¥		-	X	-	-	X		_	-	_		-
	05-15	1	X		-	×		-	×	1	-	X	1	_	×	SAME		X			X	-	-	X	-		-	-	-	_	-
"	F4	+	-	X.	_	-	×	-	1	×	-	1.	X	-	-	X	-	-	-		-	-	-	-	-	_	-	-	_	_	-
	65-1	-	X		-	X.	-	! -	×	-	-	X		-	X	-	-	X		-	X		-	X,	-	-	-	-	-	-	-
12	611-1	+	A	-	-	X	-	-	×	-	-	×	-	-	X	_	_	X		-	X		-	×			-	-	-	-	-
14	64-1	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_	-	X	_	-	X	-	-	X.	_	-	1	_	_	-
4	611-12	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-		-	-	_	-	-	-	-	-	_	-	-	-	_	-
10	64-15	+	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_	-
17	G11-50	-	-	-	1_	-	-	-	-	-	_	-	-	-	-	-	-	-	_	_	-	-	-	-	-	_	_	-	-	_	-
,.	64.50	1	_			1	1			_	_	1	1_		1		_					1	1	1				1			

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component

y component component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY

DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITHS M2/6 PROTOTYPE PILES No. 1 and 2

Monoliths M2/6 Prototype Pile No. 3 Pile Type HP 14x73 Final Pile Penetration 95.1 ft

	N.		80	,	0	80	2	0	30	3	0	34	4	CS	2	6	120	4
Pie Pen	1-1-01	5	٠,,		1	s'6		1	35	-		56		7	0		83	
Eheant!	ومزيس	300	I	1	9:0	T	1	0.0	ī	4	0.0	1	•	0 1		1		:
1	MI	1	V			V.			V			V.		V	,		V	_
	612-1	-	V	X	_	V	X.	-	Y	X	_	Y	×		X.	-	·V	×
-1	m 2	1	-	-		-	1	_	-	-		_		-	-	-		_
	412-12	-	-	-		-	-	-	-	-	-	-	-	-	-	-		-
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	612.50	-	-	-	-	-	-	-	-	-	-		×		17	-	-	0
-1	F3	+	1	X		-	N.	-	×	×	-	1		-	-	-	-	-
	05-50	-	×		-	-	1-	-	-	×	-	X	1	-	-	-	×	-
	- 25	+	-	X.	-	7	A	-	-	^	-	×	X	-	X	-	-	-
	45.15	1	×		-	-	-	-	X		-	-		-	-	+	_	-
-11	05-1	1	V	-	-	7	-		×		6	-		-	-	\vdash	×	-
4	611-1	1	1 x			×	1		x		-	X		7	1	1	×	
14	64-1	1	-	1		1	X	-	-	X	-	-	X		TX	1		X
4.8	611-15	1	1	-trucks	-		1	1	-						1		_	
11	44-15	1			-		T		1									
12	611-50	1													T			
, .	04-50	1					1								T			

Monoliths M2/6, Prototype Pile No.4. Pile Type Funal Pile Penetration 95.4 ft HP 14x73

******	~*	0	10	1	0	10	Z	-	14	3	0	40	4	0	40:	-
Pile Pen	tration	1	3 6	•		z	,		40			57			7	-
Eleni.	5-15	300	i	1	0::0	1	:	0.0	I	:	0	ī	•	02	I	:
- 1	MI	-	1			Y	-	-	Y,	×	-	V,	-	-	4	-
-	6/2-1 M2	+	V	×	-	Ť	A	-	V	-	-	Y	X		Y-	X
	611-15															
	M						_									
	11.11	-	-	_	_	_	_	-	_	0	-	_	-	_	-	-
	FI	+	-	X.	-	-	X.	-	X	X.	-	-	×	-	5	A
	25.50	+	X	0	-	×	Y	-	1	X	-	X	X		Α.	7
	65.15	1	×	-	1	×		-	X	12	-	X	1		×	-
11	61.15	1	1													
11	-8-1		X			X			X			X			X	_
11	611-1	-	X	_	_	X			X		_	×	,	-	X.	-
-11	64.1	1	-	X	-	-	X	-	-	×.	-	-	X		-	X
4	GII-15	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Sec. 15	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	64:50	1	1	-	1	-	-		1	-		1		-	1	

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and MS.

Legend

X all 3 components
T x component
L y component
V y component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM

INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITHSMAK PROTOTYPE PILES No. 3 and 4

Monoliths M2/6 Prototype Pile No. 5 Pile Type HP14x73 Final Pile Penetration 95.6 ft

*****	••• #•.	0	50	1-	0	50	2	0	SO	3	0	50			_
Pue Peec		1	3'1	0"	3	110	,.	1	2	7"		80		g	54
Section Sec	**************************************	8		:	8		:	į	I	:	1		:	1	
•	MI		V			V			V			V			
	612-1			X		V	X		V	X		V	×		1
•	M2.														
•	64-15														
٠	M3														
•	611.50														
,	63			×			X			×			X		
•	55.50		×			×			×			X			
•	F5			×			X			X			X		
10	65-15		X			X			X			×			
11	61.15		-	Table 117	-	_	-			X			X		
11	65-1		X			X			X			X			
**	611-1		X			X.	-		X	_		X	1		
14	64-1			X			X								
10	611.15														
10	45														
17	011-50												1		1
**	64-50														

Monoliths M2/6 Prototype Pile No.6 Pile Type HP14x73 Funal Pile Penetration 95ft

00000	000 B0.	0	60	1	1	264	2	0	60	3	0	60	4	0	40	5	0	60	6	0	60									
PB+ P+++	trattes 4		4			15	-		25	-		3	-	4	15			56		1	0		5	5	12					
Secotton Secotton	0	1			1	I	:	1			1			1		:	1		:	8.		:	1		•	1		1	I	-
•	21		V			V			V			V			V			X			X									Γ
•	412.11		V	1		V	X		V	X		V	×		V	X														
•	mz																	X			X									
•	612-15																													
•	l m s																	×			X									Ĺ
•	G11-50																													Ĺ
•	FB			X			X			X			X						X			X								I
•	92.20		X			X			X			X			X			V	×		V	X								
•	FE			Y			IX			X			X			X														ĺ
10	45-15		7			X			X			X			X			V	11		V	×								ĺ
11	F4			X			X			X			X			X														I
10	65-1		A			IX.			X			X			X			X			X									I
**	611-1		X			X			X	1		X			X					_										I
14	64-1																		X			X								I
16	64.15								_																					I
10	64-15																_													ı
17	611-50					_																			1					I
••	64-50									1															L					Í

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component

y component component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY

DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITHS M2/G

PROTOTYPE PILES No. 5 and 6

** COPO PRODO E ; VOL II A

Monoliths M2/6 Prototype Pile No. 7 Pile Type HP 14x73 Final Pile Penetration 34.3 t

*****	De.	0	70	1.	0	70	2	0	70	3	07	200	4	0	705	-	0	70	6	1	707		0	70	8			
Pue Peee	11- eette 11		5		:	20			30			40	,	5	2		5	7'1	0"	6	6		1	6	'	94	11	11
Section Bos Shapet	••••••	1			1		:	1		*	1	T		1	I	:	1			1	I	:	i	T	*	1	T	
•	M		×			X			X			X			X			X			V			V				۲
•	6/1-/																				V	×		V	X			Г
•	M-		X			X			X			X			X			X										Г
•	6/2-15																											
•	M3		X			X			X			X			X			X										Г
•	@12.50																											
,	1 63			X			X			X			X			X			X			×			X			Γ
•	55.55		V	X		Y	X		V	K		V	Y		V	X		V	X		×			×				Г
•	2.5																					×			X			Γ
10	65-15		\sim	X		マ	X		V	X		V	X		V	X		V	X		K							Γ
**	50																											Γ
11	65.1		X			X			X	_		X			X			×			X			X				
**	011-1						_			_											X			X				
**	64.1			×			X			X			X			X			X			X			X			1
**	67-15	_																										
10	44-15		_				_			_		_																L
17	61.50						_			1																		1
10	4-50									1															1			Г

Monoliths M2/6, Prototype Pile No. 8, Pile Type HP 14x73 Funal Pile Penetration 94.9 ft

*****	De.	a	801		0	102		(010	3	0	•	•	01	90	-	0	80	4	-	K	•
PHO P	trettes 4		3.5	5	1	15			43			47		1	55			80		1	4	11
Section Sec		1		:	1		:	1		:	1			1	I	:	1	I	:	1	I	:
•	MI		V			V			V			V			V			V				
•	612-11		V	X		V	X		V	X		V	×		V	IX		V	X			
•	ME																					
•	611-15																					
•	Mi																					
•	616-51																					
,	FS			×			X			X			X			IX			X			
•	12.50		×			1X			X			X			×			X				
•	F5 1			×			X			X			IX			IX			K			
10	45.15		×			X			X			X			X			X				
**	Fo																					
11	68.1		×		_	X			X		_	LX.						X				
**	611-1		X			14	diam're.		X	_		X			X			X				
**	64.1			×			1X			IX			X			X			X			
16	54-15																					
**	54.15																					
17	64-60									1												
10	60.50									1												

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component

y component component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM

INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITHS M2/6 PROTOTYPE PILES No. 7 and 8

Monoliths Mis Prototype Pile No. ? Pile Type 45 47 73 Final Pile Penetration

	••• 8 •.	6	190/	١.	09	0 2		0	90	3	0	200	9		105	•	0	706	6	0	90	7	~		•				
Pue Pee	tration H	1	2'2		:	211			35	-		47	1	1	.0			75	-		90		•	ts'					
Accesses	******	1			1	T	:	8		:	1			1	I	1			:	1		:	1		1	1	1	П	1
•	-71		V			X			V			V			V			V			V								۲
•	6/2-1		V	X		V	1		V	×		V	X		V	X		V	X		V	X							Г
•	ME					~																							Г
•	6/2-/5																												Г
•	ME					X																							Г
•	6/2-50																												Г
,	73			X			K			×			×			X			X			X							Г
•	65-50		×						X			X			X			V			X								Г
•	FS			×			X			×			X			X			X			Y							r
10	65.15		X						×			X			X						X								Γ
11	E4																												Γ
18	65-1		\simeq			×			×			X			X			X			×								Г
••	611-1		×			Y			×			×			×			Z.			X								Γ
••	64-1			X			×			X			X						X			X							Γ
10	6/1-15																												Γ
10	64-15																												Γ
17	60-50									L															I.				Γ
10	64.50									1															T				Г

Monoliths M2/6, Prototype Pile No.10, Pile Type HP14x73 Funal Pile Penetration 94.5 ft

*****	000 Bo.	1		1	1	00	L	4	903	,	16	204		10	05	
Pilo Poor	P somew		9		2	44	"		40			51		7	5	
Bostos Basses	0000000	1			1		•	1		•	1			I.	I	:
•	m.		V			V			V			V			Y	
•	6/2-1		V	X		>	X		V	X		V	×		Y	×
•	#1Z															
•	612.15															
•	MS															
•	617.00															
•	F3			X			X			X			X			X
_•	65.50		K			X			X			×			7	
•	ES			X			X			IX.			K			K
10	65-15		X			X			X			X			X	
11	F4															
118	G5-1		K			X			IX			X			X	
11	G/1-1		X			×			X			X			X	L
••	64-1			X			K			IX			X			X
**	61175															L
**	69-15															L
17	611-50															L
10	64.50									1						

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component

y component component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITHS M2/6

PROTOTYPE PILES No. 9 and 10

Monoliths M2/6 Prototype Pile No.11 Pile Type MP102 Final Pile Penetration 47ft

Monoliths M2/6, Prototype Pile No.12, Pile Type MP102 Funal Pile Penetration 53.75 ft

*****	B.		110	· .	-	1	-		/24	• •		7.			KE		-		nin.	1	20	2			
Pue Pees	trettee N		2		ľ	22	-		6.			21			7 7			47			21		53	9"	
Social Social	0000000	1		:	1		:	i			1	1		1		:	1	I	:	1	1	:	8	1	
•	MI		V			V			V			V			Y			V			V				
•	6/3-1		Y	X		V	X		V	X		V	×		V	X		Y	X		V	X			
•	70																								
•	62-16																								
•	Mà																								
•	61:-52																								
,	2			X			X			×			X			IX.			X			X			
•	65.50		×			X			X			×			X			X			X				
•	15			X			X			X			X			$\mathbf{I}\mathbf{X}$		3	X			X			
10	65-15		X.			X			X			X			X			X			X				
11	G1-15										1_													-	
110	65-1		×			×			X			X.			×			X			X				1
- 10	611-1		X			X			X			X.	_		X		_	X			X				
**	64-1			X			X			X		_	X			X.			X			X			
••	641-15																_								
••	64 - 15									1			_												
17	011-50									1			_												
10	64.50									L															

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

0

x all 3 components

T x component

y component

a component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITHS MAG PROTOTYPE PILES No. 1 and 12

Monoliths M2/6 Prototype Pile No. 13 Pile Type HP 14x73 Final Pile Penetration 51ft

*****	000 BO.		130	1.		130	2									
PHO POO	trettee H	1	3'2			25	,		61							
Secotion Sec	******	1	I	:	1	I	:	1		:	1	T	:	1		•
•	M		V			V				-						_
•	618-1		V	X		V	X									_
•	At 2								1							
•	612-15															
•	M.						1									
•	618.50															
7	Fi			×			X									
•	65.5		X			×										_
•	2			×			X			-		-			-	
10	65-15		×			X										
11	61-15															
**	65.1		X			X										
10	61-1		×			X										
14	64-1			X			X									
10	64.12															
**	44-15															
17	G1- 80															
10	64.50															

Monoliths M2/6, Prototype Pile No. 14, Pile Type PP 14x0.375
Funal Pile Penetration 51 ft

	ees 80.	1	40	1.	1	10	2	1	40	3	1	40	4			
PRO POO	wellos 4	•	14	•		15			30		4	15	•	"	51	
Jesottes Bog	00020000	1.		•	1.		•	1		:	1.		3	1.		:
•	mi		V			V			マ			V				1
•	612-1		Y	X		V	X		14	X		IV	X			1
•	W2								1							7
•	611-15								1						1	
•	F 3											1			_	
•	3/2-50			1					1_	1		1			1	
•	ES			K			X			X		1	X			1
•	65.50		IX			X			X			X				1
•	16		1	X			X		1	X		1	IX			
10	65-15		IX			IX			×			IX			1	
**	63-15								1						1	
11	05-1		$\mathbf{I}\mathbf{X}$			X			X	-		IX	_		1	×.
90	6/1-1		LX			IX.			IX	1	L	IX			1	
94	64-1			\mathbf{IX}			X		1	IX			LX		1	
10	011-15		1				1		1				1_		-	
••	34:15								14			1	1	_	-	
17	611-60								1	1		1	1		1_	
10	64-60	I	I	1	I		!					1			1	

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component

y component component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITHS M2/6 PROTOTYPE PILES No. 13 and 14

Y7C-825 Phase IV; VOL III A

M.8 INFORMATION DIGITIZED FROM ANALOG MAGNETIC TAPE FOR MONOLITH M2

Geophora	A	ototy	pe !	ile	No	and	l De	pth	of 2	igit	gat	ion ((ft)	
No.	1	12	3	4	5	6	7	8	19	10	11	1/2	13	14
G5-1	35 60 104	20,35 50 70	35,9, 70	35 50 70	35 50 70	35,50 70,94	35 70, St	50 70 94	25,15,	34	25, 45	25 50	20 35 50	35 50
G5-15	30		35,50	35 50 70	35 50 70	35 50	70 94	50 70 54 50	34,70,		25 45	25	35 50	20 35 50
65-50	304	35,50, 70,94				35 50	70 54	50 70 94	3570.	20,35, 50,70,	25 45	25 50	35 So	30 30
GIFI		20,35 5970,				35 50		50 70 94	3570	20,35 50,70,	25 46	25 50	36	20 35 50
MGI						35 50 70 94	5	50.	25	20 35 So 70	450	25°	20° 36° 50°	3,
MG2						70 34	35		25					
MG3						90 94	35		25					

Note: " & Component only

Depth of Digitization is the prototype pile tip depth at which the digitized data recorded during the tests on analog magnetic tape, were processed through a computer.

> PILE DRIVING EFFECTS TEST PROGRAM INFORMATION DIGITIZED FROM ANALOG MAGNETIC TAPE FOR MONOLITHS M1 & M6

> > FOUNDATION INVESTIGATION AND TEST PROGRAM
> > ENIOTING LOCKS AND DAM No. 20
> > ST LOUIS DISTRICT. CORPS OF ENGINEERS.

Western Cycle Committee

PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDIX N
MEASUREMENT DETAILS
MONOLITH M3

Y7C825 Phase IV; Vol IIIA

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Y7C-825 Phase II; vol IIA

N MEASUREMENT DETAILS, MONOLITH M3

N.I COMPLETE FIELD LOGS OF INSTALLATION OF TIMBER PILES UNDER MONOLITH M3

The identification number (Id. No.) at the top right-hand corner of each data sheet includes the timber pile number shown in Fig. 5.2, Volume III.

The timber pile number is given by the two digits

Preceeding the last two zeros of the Id. No. (for example, page N-2 corresponds to timber pile No.03)

The field logs are presented in chronological order of timber pile installation.

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST 1.7 or 7 TON. 03 03 160 1 0300 PILE DRIVING RECORD Pile Type Douglas Fr (2) Hammer Pile length 42' Facray 22 Oct 28 Yukan Y-1 Date - 1230 - 1630 15,000 Time openting pate Gobblein Tempeter-Kuchlaned Grand al. Treach Level · Royald Depth Remorts Blows Redyalid et al 20 35; liquite in ceticum Pile suks 15 6 of resider: remais pile;
ple sinte d'inité pi

on saile ple sinte
de l'inité de ; et to

15'00', 23', pile sinte 11 .. 11 13 11: 111 14 . . 1 14 15 10 14 10 14 24 K 11 111 .. 24 25 30 111 32 24 35 111 u 39 10 42 30 51 55 24 20 65 -110/0. 19:30 restrike 10/25/12 Of (SOW) SO.-P4.
Selected to District.
Selected to District.
Selected to District. Ocapacity, kips PLYEN dean · Pestrike VJetling Lepth 1 H.C. 4.5% E ... WCE, TTE BIS Phase T VOL IJA

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PRE DRIVING EFFECTS TEST P. I at I TON. 05 03 160 1 2800 PILE DRIVING RECORD Pie Tipe Dovales Fir Vulcan VI 22 0 + 1978 Date Hemmer Ale length ALT' 15000 19:30 Energy. Time . openting pate 60 blas fair In peter - Rab Giften Grand al. Trench rec o Legal Depth Remorts - MIG B10-3 64 0-1 Pre- yetel to 17 Ple Cun to 15 . 111111111 " 111111111 .. 1111 11 13 . 0 .. 19 16 11 111 111 21 10 1 1 1 19 1111 11 25 1 -29 14 1111 11 28 1 111 411 31 11111 26 32 11 32 22 40 Jet, set to to 93' 43 30 21 50 51 30 73 1) 33 8- 5 34 157/4" restrice 10/23/73 byrame Mersurenests Seprend No Dipth To Notage of restricted 20'-86'11' Pile parties 1'-2% S O Capacity Kips · Restrike V Jetting Lepth -2.2% H-WCE, YTC BIS, Phase II VOL ITA

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST

P. 1 -1 1 TON. 03 03 T60 1 1600

PILE DRIVING RECORD 22 Oct 1938 Date Yulcan VI Pike Type Douglas Fir Hammer 20.40 Energy. Sopp (Ills Time Pile length 42 . openting Rate 60 blaus frie In putde - Bab Great Grand al. Trend here! o Perfell 20 40 40 Depth . B10-3 Remorts --21141 11!1 Pre- jetted to 27' 111111111 11.1 1 11111111 .. 12 13 . 1: Jet when S. C. sweet at 14 111 1111 . 7 14 10 Jet plan S.E. ad & pile 19 9 10 0 M 1111 . 11 0 . 111 111 .. 11111 24 15 1 1111 21 :111 111 · 6 25 14 11. 20 11 25 30 22 60 .. 20 -0 52 21 20 fe 4 . . 22:33 30 16/10 restrike 10/25/71 Seprence No Depth of Pile matter of EO.O.

21 -384 - Mile Pile matter of EO.O.

22 -384 - Mile Pile matter of EO.O. O Capacity, Kips V Jetting depth - 3.0% €--

WCL, YTCBIS, Phase II

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 20 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

FON. 08 08 160 1 1500

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•	1	and also all annual districtions	111		11	11	IT	III	П	III	TT	П	Ш	П	1
distribution (december)	1	and clay yet pump of may	11	1	††	Ħ	tt	H	Ħ	111	tt	111	111	Ħ	1
	-	AL BOOKER	111	1	††	ti	††	111	Ħ		t÷	11	ĦĦ	††	1
<u> </u>	-	Pile sinks 20; location	11	7	tt	††	tt	H	Ħ	11	1:	. 11	111	††	1
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	-		-	-	11	+	+	-	+	-	+-	+++	+++	++	1
-11	-			+	11	11	+	-	-	++	+		+++	#	1
14	-			+	-	1	+	-	+		+	1	1	++	1
13	-			-	1 1	+	1	11	1		1	'	1	#	1
11	1			4	MALL PARTY	1	1	1	-	1	+	1	111	#	4
11			-	-	-	+	+	_	-		+		+++	#	4
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19		1	11	4	1	_	1	4	1	-	1	111	1	#	4
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L				1	1	1	1	11	1	1	1	111	11	4	1
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13	21		1	1	1	1	0	11	Li	11	1	11:	111	11	14
16	24		1	1	1	1	1	111	1	. 1	1	11	11	11	17
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Violing dapth

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11.13

WOODWARD-CLYDE CONSULTANTS 08 08 160 1 P2450 LOCKS AND DAM NO. 26 PRE DRIVING EFFECTS TEST TO No PILE DRIVING RECORD Pile Tipe Douber Felt)
Pile length 42' Vulcan V-1 23 Oct 16 Date Hammer Energy. 15,000 Time 0045 7 0157 60 blain Enspetter - Kuch Grade Grand al. Treach Level . Openting Rate Dopth Cept le Remorts Blows 64 oo 45 During progetting at drags to 24 23 20 24 31 27 Slowly; wash at 27 with good return Clay and back as water ceturas --. Pile sinks 21' . 4 B. 1111 11 13 14 14 19 10 111 11 0 10 .. . 11 0 14 111 21 11 1111 26 11 32 25 25 28 .. 1101 01:35 Set to 26 30 D 24 69 01:45 77 236/2" 01:57 . . 34 92/1 restrice 10/25/11 draws no property her

© Capucity, kips © Parting depth

1 H.C.

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 08 03 160 1 0600

Pile Type Doglas for Hammer Vilkau VI Date 23 Oct 28
Pile langth 42.1' Energy 15,000 Time 0710 + 0852
Grand al. Treuch Leas . Operating Rate 60 billion Empatter Lactaffed

Ci Ci	Blows	Remorts	: 2:	ü		25.1		•		L1)	64_		-	1
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		Light returned at 12'		11	11	1	-	-	11	111	11	Ħ	H	Н
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- 11	61		1 .	1	1		11	1	1	1	11	1	111	П
N	.50		1	T	-		11	1	11		11	AT.	11	П
24	45	Louis A condition and at 28's	-	1		1	1	1	1	1	,	T	1	П
	1 60	Lian k and returned at 28;	7	-	-	1	1	1	1	+-	1	+	-	П
30	77	Jet to 25 while drawn	1 1		1	1	1	1	11	1	0	T	1	П
21	1 2	Tet to 27 While drive	THE REAL PROPERTY.		1	1		1	1	1	11	11	IT	П
31	6	7	101	11	1		1 1	11		1	11	Ħ	T	П
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39	51	retract at	1 11	b	-	ŧĐ	11.	111	7.	11	11	Ħ	1	П
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Pile temp de

O Capacity, tipe

Restrict

Vieting depth

. V7COLS Phase W 3.4% E ..

JAI. L.

WCL, YTCOIS, Phase TO

14:

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 20 PILE DRIVING EFFECTS TEST P. I at I 08 03 160 7 1300 ID N. PLE DRIVING RECORD Pile Tipe Doughe Sir Vulcan V-1 Date 23 Oct 28 15,000 Ale length 417' 0910 - 1043 Energy Grand al. treat level , operating pate 60 Wais Empeter - Late Tio Driving Besietunes Remorts 810-5 0110 --Prejetted to 27 Pile SINKS 15'6" At 10' wood returned 11 ALR' much lighte 1111 ceturared will disnete 11 of Approx LK 14 13 14 GO 14 At 19' much lank return 10 At 20' lase Carulation 10 14 OI 12 At 28, clay bulk rehim .. 9 .. 36 29 30 10 11 53 blow Jet to 27 cla ball, lank a 14 24 93 16 10 19 .. Jel to 50' white driving 20 21 . 51 25 . 34 24 10:45 restrike 10/25/72 De prints O Capecity, Kips

al para 0.8% N a 1.3% €

■ Restrict Apple VICL

WEL, THE BIS THOSE WAS NOT A

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM MO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

FON. 08 08 160 1

Pile Tipe Dangles &r
Pile langth 41 Vakan V-L Dote Hammer 15,000 Energy. 1050 - 1342 . openting pate 60 Milain Empeter - Lacte Fra Grand al. track level Both I Bun | Persetts O Driving Resistance biles

Es par	Blows	Remorts	0,5	*	-	r.	25.	***	-		-	.,,	-	_	-	4
0-1	111	I see Pile sink H' sile is		T	T	IT	T	III	TI	Ti	T	TT	П	ĨT	П	П
e e e e e e e e e e e e e e e e e e e	111	3" to Sipula removed	111	1		П	Ш	Ш	П	11	П	TT	П	П	IT	П
	111	and repositioned; pile	1111	*	1		III	П	П	11	П	T	П	П	П	П
THE REAL PROPERTY.	111	SINKS 3'	111	1	ī	T	T	m	П	Ti	П	TT	П	П	Ħ	П
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13	160			7			1	1		-	П	- 1	1	1	Ħ	Ħ
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	22	lose circulation at 20'		1	1		10	111	1	11	П	11	11	1	II	П
	02	limb sakch formet wa	data		1		10		11	-1	П		11	Ti	Ħ	Ħ
11	42			1	-		To		1	11	1	11	11	1	11	П
ü	28	LIAME IN WAS A 25' A 2	7	1	1		10	1.	1	7	11	11	11	T	11	П
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16	33	57 blenie	T		1	-		111	Т	0 1	I	11	11	1	11	П
N	40				1		1		T	1	4		11	1	11	\mathbf{D}
ш	12		1	11	1				T	1		0	1	!	1	П
	10	Jet to 25.5 while design	1	T			I	1	I	1	.0	la .	1			П
20	50			П					1	1	1	1	L	i.	11	П
21	75			П	1		•	-0	\mathbf{I}	. 4	1	•	11	П	П	П
	84	Jet to 27 while driven	1 1	П	1	. 1	IC	\mathbf{H}			1	1	11	П	П	D.
1)	13	- 3	1	I	1			0	L	, 1	1	1	11	11	1	Ш
24	39	Tet to 35 while drive	1 !	П		L		11	I	11	d	11	П	11		<u>u</u>
11	30/25	18:42	111	1	1	0	+	O.	T	1	1	L	T.	Ш	П	П
	21/0.	restrice wiseha	1	1	1	3	74	1	10	11	2		11	Ш	П	Ш
			1 1	1		: :	1	111		11	1	11	11	H	Ш	П
			1	II			1	11		П	П	П	П	Ш	П	Ш
				1	1		1	11	Li	П	11	11	11	11	П	П
			1	,		1		11	II	II	1	11	11	II	П	П

OT (SPOT) WITE SE. 18. 6 18 Die of BOD .
Sed-tone no Diego At
places were necessary

0.1% W

O Capacity, kips

Restrict V Jothy depth

WCE, TTC BIS, Phase TI

4708'5 Phase 7 Vol 1111

N.2 SUMMARY LOG OF DATA ACQUIFED DURING

PRELOADING , MONDETH M3

ID No .: 07-03107-

MONOLITH(S) TESTED: M3 & M7

TEST TYPE: PRELOADING

	Sequence No.	0000	0000	0007	0011	0023
	Date/Time	12/19/18	12/19 0135	12/19 0549	149 0707	12/19 1045
	Description of Event	MITTALIBATION	DIITMUZATION	PULAYUL V= 2401 MS V= 301 MT	FULL ACIAL V=2401 M3 V=301 M7	RULAXIAL H=RUL
	 Dial Gages, P(1) 	V	Y	/		V
<	Optical Horizontal Control, P(1)	V	pertial	partial	refbeausonly	partial
DATA	Optical Vertical P(1)	V		ref book only		ref booms only
	- Tape Extensometer, P(1)	V				ref booms only
PRIMARY	Tilt Meters, P(1)		~	V		✓
	Timber Pile					
	Inclinameters, S(9)					16.3219014
	Timber Pile Slopes, S(9)	<u></u>				
	. Tell Tales, S(10)	/	V	V		
1	Surface Settlement, S(11)	/				
DATA	Ground Inclinameters, S(12)					
7	Sondex, S(12)					
YO	Piezometers, S(13)	/				~
SECONDARY	- Thermo-couples, S(14)	V		/		/
SEC	Strain Gages, S(10)		V	/		/
	Record No 02		BALANCE	5 11971		4 "
	Record No 03					

Note: / = Complete set of reedings taken

Y7C 885 Phase I Vol II A

ID No .: 07-03807-

MONOLITH(S) TESTED: M3 & M7

TEST TYPE: PRELOADING

	Sequence No.	00	42	00	48	00	70	00	80	00	92
	Date/Time	12/19	1523	12/19	1738	12/19	2158	12/19	2306	12/20	0438
	Description of Event	He	WIAL FULL = 10	H=	AVIAL FULL = 10	H-	AXIAL FULL 20	Hel	KIAL FIL 25	H=F	AXIAL PULL 30
	Dial Gages, P(1)	V		12		~		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
<	Optical Horizontal Control, P(1)	1	/	par	tial			,		per	tial
DATA	Optical Vertical P(1)		/					1	/		
	Tape Extensometer, P(1)	•	/					ref te	me only		
RIMARY	Tilt Meters, P(1)		_					,	/		
P.											
	Timber File Inclinometers, S(9)										
	Timber Pile Slopes, S(9)										
	Tell Tales, S(10)										
<	Surface Settlement, S(11)										
DATA	Ground Inclinameters, S(12)	,	/					1	/		
¥	Sondex, S(12)										
VO	Piezameters, S(13)		/					1			
SECONDARY	Thermo-couples, S(14)	,						1	/		
SE	Strain Gages, S(10)										
	Record No 02	-		-		-		-			
	Record No 03										

Note: / = Complete set of readings taken

Y70855 Phase 2 , Vol = 1

ID No .: 07-03407-

MONOLITH(S) TESTED: M3 LM7

TEST TYPE: PRELOADING

	Sequence No.	0095	0115	0131	0134	
	Date/Time		12/20 0939			
	Description of Event	FREAKIAL H= Vo Füel N= 30	FOIL AKIAL H = FULL N = 40	FULL AXIAL H=FULL N=47	V=0 H=0	
	Dial Gages, P(1)		/	/	/	
•	Optical Horizontal Control, P(1)	partial	ref beams only	/	ref beams only	
DATA	Optical Vertical Control.		-	/	ref homes andy	
	Tape Extensometer, P(1)			net bouns only	ref beam only	
PRIMARY	Tilt Meters, P(1)			~		
PR						
	Timber Pile Inclinameters, S(9)			No. 131 19 mly		
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)					
4	Surface Settlement, S(11)					
DATA	Ground Inclinameters, S(12)					
	Sondex, S(12)			√ escept		
DA	Piezometers, S(13)			V		
SECONDARY	Thermo-couples, S(14)			V		
SEC	Strain Gages, S(10)				1	
	Record No 02				4	
	Record No 03					

Note: / = Complete set of readings taken

Phasety, Vol III. A

N.3 SUMMARY LOS OF DATA ACQUIRED DUPING

ID No.: 09-03607-

MONOLITHIS) TESTED: H3 & M7

TEST TYPE: PDET

	Sequence No.	0000	0006	0102	0105	0202
	Date/Time	s/1/19 1200	3/2 08 00	3/2 1430	3/2 1800	3/3 0000
	Description of Event	DATTALIBATION (NO LOAD)	FULL AXIAL AND LATERAL LOW APPLICATION	PILE NO. 1 ~50 ft MUFIBIERRYTON	Pile no. 1 ~100ft rll reletation	PILE NO. Z ~52ft
	 Dial Gages, P(1) 		>	/		/
•	Optical Horizontal Control, P(1)		>	/	V	/
DATA	Optical Vertical P(1) Control	/	/		✓	
RYC	- Tape Extensometer, P(1)		/	/	V	~
PRIMAR	Tilt Meters, P(1)			/	/	/
_	Timber Pile					
	Inclinometers, S(9)	V 10.25			NAZ	
	Timber Pile Slopes, S(9)		,			
	/ Tell Tales, S(10)	1			~	
ATA	Surface Settlement, S(11) Ground	/		/	/	
DA	Inclinameters, S(12)	/			partial	
A	Sondex, S(12)					
SECONDARY	, Piezometers, S(13)	V	/	/	V	/
00	/ Thermo-couples, S(14)	/	~	/	V	~
SE	Strain Gages, S(10)	/	~		1	
	Record No 02	BALANCE	10,11		12	14.15
	Record No 03					

Note: / = Complete set of readings taken

YTC885
Phase IX, Vol III (

ID No.: 09-03407-

MONOLITH(S) TESTED: M3 & M7

TEST TYPE: PDET

	Sequence No.	0203	0300	0302	0305	0402
	Date/Time	3/3 0230	3/3 0800	3/3 1400	3/3 1800	3/3 2320
	Description of Event	PILE NO. 2 ~ 96ft RUL PRINTERNATION	PILE NO.3 START	PLE NO.3 ~52 ft HETENETIKTION	PILENQ 3 ~ 96H FULL PONETRATION	PILENO.4 ~52# MIFFIERRATIO
	Dial Gages, P(1)			V	V	/
•	Optical Horizontal Control, P(1)	V	/	✓	/	V
DATA	Optical Vertical P(1)	/	✓		V	V
4	Tape Extensometer, P(1)			V		/
PRIMARY	Tilt Meters, P(1)	~	✓	/	/	/
	Timber Pile Inclinometers, S(9) Timber Pile Stopes, S(9)					
	Tell Tales, S(10)	1	1	1	1	
•	Surface Settlement, S(11)		J	1		partial
DAT	Ground Inclinometers, S(12) Sondex, S(12)		×			
AR	Piezometers, S(13)	1			1	1
SECONDARY	Thermo-couples, S(14)	1	V	J	1	7
SEC	Strain Gages, S(10)	V	1	V	V	1
	Record No 02	15	16	17	18	19
	Record No 03					

Note: / = Complete set of readings taken

Y7C825

ID No.: 09-03:07-

MONOLITH(S) TESTED: M3 & M7 TEST TYPE: PDET

	Sequence No.	0403	0405	0502	0504	0504
	Date/Time	3/6 0800	3/5 1630	3/5 2200	5/6 0030	3/6 0800
	Description of Event	PLE NO. 4 ~52ft INLETERATION	PILE NO. 4 ~96 ft FULLENETRATION	PILENO,5 ~53ft MLF REMARKS	PILE NO. 5 ~%ft	PLE NO.5 ~96ft PLL REFERENCE
	Dial Gages, P(1)	✓			V	
•	Optical Horizontal Control, P(1)	~	/		/	
DATA	Optical Vertical P(1)	V	V	/	V	
	Tape Extensometer, P(1)	/	V	1	/	~
PRIMARY	Tilt Meters, P(1)	1	~	~	1	/
	Timber Pile					
	Inclinometers, S(9)					
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	✓	V	/	/	/
4	Surface Settlement, S(11)		V	V	/	
DAT	Ground Inclinometers, S(12)					
7	Sondex, S(12)					
A	Piezometers, S(13)	1		/	~	
SECONDARY	Thermo-couples, S(14)	~	~	~	~	
SEC	Strain Gages, S(10)	7	/	1	1	1
	Record No 02	20	22	23	24	25
	Record No 03					

Note: / = Complete set of readings taken

YTC825 Phase IN Vol III A

ID No.: 09-03107-

MONOLITH(S) TESTED: M3 & M7

TEST TYPE: PDET

	Sequence No.	0504	0604	0606	0703	0800
	Date/Time	3/6 1200	3/6 1600	3/6 2100	3/7 0030	3/7 0800
	Description of Event	PILE NO. 5 ^ 96ft RUL HONETKATION	PILE NO 6 ~52ft HALF REMETRATION	PILE NO.6 ~96Ht RULIBHETHETHO!	PILE NO. 7 ~50ft PULL POLETBATION	PRENO.8 START
	Dial Gages, P(1)		/	V	V	
•	Optical Horizontal Control, P(1)	~	V	/	✓	/
ATA	Optical Vertical P(1) Control, P(1)		~	V	✓	/
YD	Tape Extensometer, P(1)			~	V	V
PRIMARY	Tilt Meters, P(1)	V	V	~	~	V
	Timber Pile Inclinometers, S(9)					
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)		/	V	V	V
4	Surface Settlement, S(11)				/	
DAT	Ground Inclinometers, S(12)					
	Sondex, S(12)					
SECONDARY	Piezometers, S(13)	/	V	~		/
O	Thermo-couples, S(14)		V		1	/
SEC	Strain Gages, S(10)	-	~	~	/	
	Record No 02	26	27	28	29	
	Record No 03					

Note: / = Complete set of readings taken

ID No .: 09-03107-

MONOLITH(S) TESTED: M3 & M7

TEST TYPE: PDET

	Sequence No.	0802		
	Date/Time	3/7 1200		
	Description of Event	PILE NO. 8 ~ 51ft RURBERRATION		
	Dial Gages, P(1)			
4	Optical Horizontal Control; P(1)			
DATA	Optical Vertical Control, P(1)	/		
7	Tape Extensometer, P(1)	/		
PRIMARY	Tilt Meters, P(1)	/		
A.				
	Timber Pile Inclinometers, S(9)	y mozet		
	Timber Pile Slopes, S(9)			
	Tell Tales, S(10)	V		
4	Surface Settlement, S(11)			
DATA	Ground Inclinometers, S(12)	/		
	Sondex, S(12)			
•		.,		
DAR	Piezometers, S(13)			
ONDAR	Piezometers, S(13) Thermo-couples, S(14)	1		
SECONDARY		Ž		
SECONDAR	Thermo-couples, S(14)	31,32	7	

Note: / = Complete set of readings taken

Y7C825 Prayy, 61 11 /

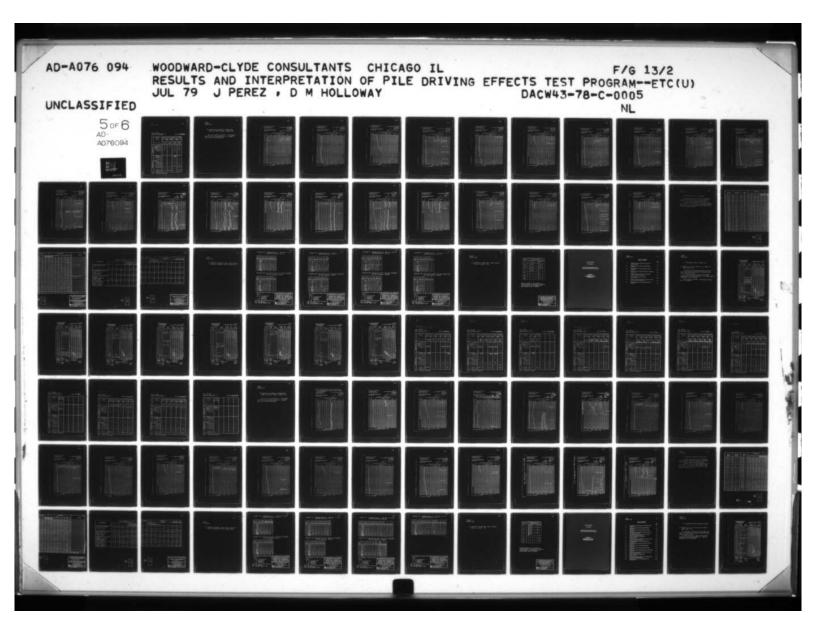
N.3 SUMMARY LOG OF SATA ACQUITED SOFTING LATERAL LOAD TESTING , MOHOLITH MS

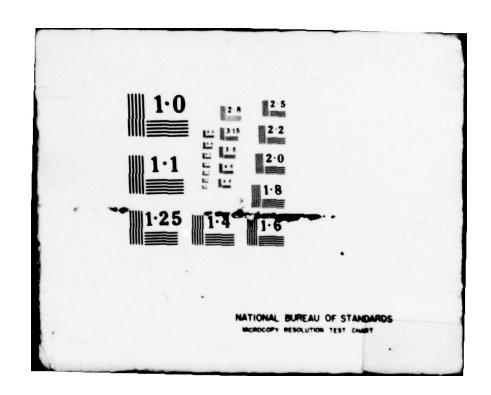
ID No.: 10-03

MONOLITH(S) TESTED: MS TEST TYPE: LOAD TEST

	Sequence No.	0000	0001	000Z	0003	0004
	Date/Time	3/8/19 0000	3/8 0900	3/8 1420	3/8 1800	3/9 0100
	Description of Event	INITIALIZATION M 3	V= 240t H = 0	V= 400t H = 0	V=240t H= 0	V= 240t H= 48t
	Dial Gages, P(1)	V		V	~	/
4	Optical Horizontal Control, P(1)	V	✓	~	V	/
DATA	Optical Vertical Control	V	/	/	V	~
	- Tape Extensometer, P(1)			/	~	/
PRIMARY	Tilt Meters, P(1)	<i>\</i>		✓	<i>></i>	/
	Timber Pile Inclinometers, S(9)					V Except
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	· V		~		/
DATA	Surface Settlement, S(11) Ground Inclinometers, S(12)	-				
1.12	Sondex, S(12)					
DA	Piezometers, S(13)	V		V	~	/
SECONDARY	Thermo-couples, S(14)	/	V	/	~	/
SEC	Strain Gages, S(10)	V	~	~	~	/
	Record No 02	BALANCE	5	6	7	8
	Record No 03					

Note: / = Complete set of readings taken





PARCE VOI IIA

MONOLITH(S) TESTED: M3

TEST TYPE: LOAD TEST

	Sequence No.	0004	0006	0007	0008
	Date/Time	s/9 0400	3/9 0900	3/9 600	2/9 2230
	Description of Event	V= 240t H = 48t	V=2401 H=481	V=240t H=%t	V=240t H=96t
	Dial Gages, P(1)	V	7		1
•	Optical Horizontal Control, P(1)		/	/	V
DATA	Optical Vertical Control, P(1)	/		/	
	Tape Extensometer, P(1)			/	
PRIMARY	Tilt Meters, P(1)			/	
	Timber Pile Inclinometers, S(9)			√ No. ZB	
	Timber Pile Slopes, S(9)		,		
	Tell Tales, S(10)			✓	/
TA	Surface Settlement, S(11)				
DATA	Ground Inclinometers, S(12)			/	
	Sondex, S(12)				
V	Piezometers, S(13)			1	1
SECONDARY	Thermo-couples, S(14)			/	~
SEC	Strain Gages, S(10)	1			V
	Record No 02	9	10,11		13
	Record No 03	No.			

Note: / = Complete set of readings taken

Y7C-825 Phase Is; NOL III A

N.5 COMPLETE DRIVING RECORDS OF PROTOTYPE PLES
DRIVEN WITH IMPACT HAMMER, MONOLITH M3

The driving records are presented in chronological order of driving for prototype piles No.1 through 8, driven with a VULCAN 010 hammer.

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 Date_3/2/79 PILE DRIVING EFFECTS TEST Sequence No. PILE DRIVING MEASUREMENTS PILE NO. _____ 0 Ble - Count. 61/11 Depth 3 4 10 11 11 15 14 15 16 11 15

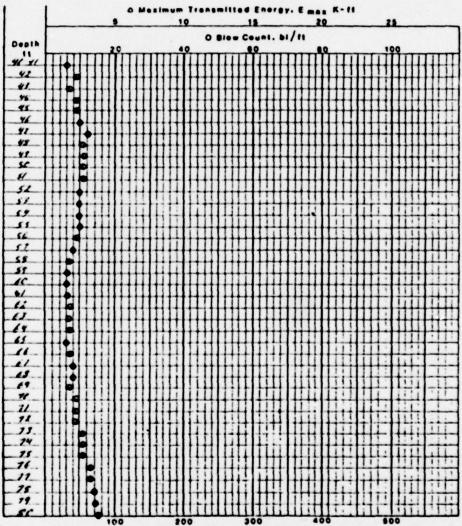
WCC. Y7C825. Phase IT SWOL TO A

I.D. No. 09 03 180 0 010: Doto 3/2/15

Operator 67

PILE DRIVING MEASUREMENTS
PILE NO. _______

Time Sequence No.



WCC. Y7C825. Phone I/; ML I 4

0.2 013

LE DR	VING	MEA	SUR	EM	EN	TS						Fir		_	-	•	- :	_	**	-	••	••	N .
1		1			m u #	1	•••	•••	110	11		• • •	, (20		- 11			25			
							0		•••	:			/										
SCE	ШП	IIII	ÎII	Ш	Щ	Ï	П	П	II	ď	П	II	П	П	Ц	П	H	II	II	ï	İ	II	П
82	Ш	T	 	Ш	Ш	H	₩	Ш	#	H	H	#	#	H	H	H	₩	₩	₩	#	H	H-	H
57	####	161	111	Ħ	†††	lt	H	H	#	H	Ħ	#	tt	H	Ħ	H	Ħ	tt	H	tt	Ħ	Ħ	H
85	ШП		Ш	Ш	111	11	Π	П	11	Ц	11	Π	H	H	П	П	Π	${\rm I\!I}$	П	Ц	П	Π	П
26	 	114	1111	Ш	##	#	H	Ш	#	H	₩	#	₩	H	H	H	H	H	₩	#	H	#	Н
83	++++	++++	1+++	H	₩	Ħ	++	Н	₩	H	H	#	H	H	H	H	††	Ħ	H	Ħ	H	#	Н
59	11111		UTT	11	Ш	11	11	Ш	11	П	П	11	П	I	Ħ	Ħ	П	Ħ	П	İ	П	П	
90	Ш		411	П	Ш	П	Π	Н	\mathbf{H}	П	H	\mathbf{H}	Π	H	H	H	H	H	H	#	H	H	H
91	++++	4444		Н	₩	H	++	H	#	H	H	++	++	H	₩	H	₩	H	H	#	₩	₩	Н
91	++++	++++	4+	1	+++	11	#	H	++	H	+	++	#	+	tt	H	††	Ħ	tt	+	H	#	H
94	1111	1111	131	H	111	11	11	Ш	11	Ħ	Ħ	11	tt	I	il	Ħ	\Box	Ħ	\coprod	1	I	苴	
95	ШП	$\Pi \Pi$	9	Ш	Ш	П	${ m II}$	Ш	\prod	Ц	Ц	1	П	Ц	Ц	Ц	П	П	П	1	П	11	Li
26	11111	4444	1114	H	+++	#	++-	Н	#	H	H	++	₩	H	H	H	++	₩	#	₩	H	#	Н
97	HHH	++++	 	H	+++	H	++	H	++	Н	H	H	††	H	H	H	H	H	++	#	H	++	H
71	****	1111		ut	III	11	I	Ш	11	Ħ	I	Ш	11	П	Ħ	Ħ	П	Ħ	Ħ	I	П	П	
100	Ш	$\Pi\Pi$	Ш	Ш	Ш	H	Π	Щ	11	П	4	44	H	П	Ц	П	\mathbf{H}	Ц	H	4	1	#	L
101	++++	++++	HH	##	ψH	Ħ	++	Н	++	H	H	++	H	H	H	H	H	₩	₩	#	#	++	Н
105	++++	ittt	1111	Ht	16	Ħ	Ħ	Ħ	11	H	Ħ	#	H	H	Ħ	tt	Ħ	Ħ	Ħ	1	Ħ	Ħ	H
KY	ШП	\mathbf{III}	Ш	Ш	Ш	1	П	Ш	11	П	П	П	П	П	П	П	П	П	П	1	П	П	
ics	Ш	$\Pi\Pi$	Ш	Ш	Щ	A.	11	Щ	41	Н	Н	#	11	H	H	Н	#	H	#	4	Щ	11	1
100	HHI	++++	HH	H	+++	1	+	Н	++	Н	H	++	H	H	H	H	++	₩	₩	+	H	+	+
165	11111	1111	1111	Ħ	##	H	11	Ħ	11	Ħ	Ħ	T	It	Ħ	Ħ	H	Ħ	tt	#	1	1	1.	t
109	ШШ		IIII	Ш	Ш	11	T	П	1	I	П	Ц	П	П	Ц	H	П	H	Π	1	I	11	I.,
110	HHH	1111	1111	Ш	111	H	++	Ш	#	H	+	++	4-4-	μ	-	H	#	H	#	+	11	++	Ľ
	1111	1111	1111	H	1+	H	1	H	+1	H	H	#	1+	1:	:1	H	H	H	+	+	+	-	H
	11111	1111		ilt	111	11	TI		1	Ħ	T	T	11	it	Ħ	Ħ	T	Ħ	II	1	II	1	
	ШШ	$\Pi\Pi$	III	Ш	Ш	II	11	П	II	Į.	L		1	1	Ц	H	H	Ц	Ľ	4	Ц	4	
	11111	1111	1111	Ш	111	11	11	Ш	11	H	+1	4	1+	H	Н	H	Ħ	#	#	4	ļ ¦	#	H
	HIII	+111	HH	H	H	H	++	Н	+	H	H	H	lt	H	tt	H	+	H;	it	+	+	++	t
	11111	1111	ltt	H	111	11	ti	Ħ	11	Ħ	Ħ	#	tt	H	Ħ	H	11	Ħ	†	1	IT	11	1
	iIIII	1111		Ш	111	Ti	11	Ħ	11	Ħ	П	П	11	Ħ	II	I	u	Ĭi	11	1	ii	11	I
	ШП			Ш	Ш	1	П	Ш	П	Ü	П	Ш	П	Ц	Π	Ľ		Ii	П	1	11	u	

WOODWARD-CLYDE CONSULTANTS

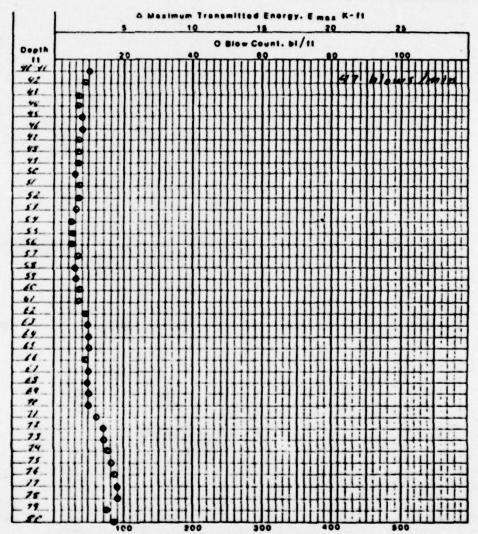
WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST Operator_UA Sequence No. PILE DRIVING MEASUREMENTS PILE NO. _ 02_ O Blow Count. bi/tt Decin 10 11 12 15 19 17 18 11 11 25 17 17 30 11 15

WCC. Y7C825. Phase IT SVOL EA

1.D. No. 09 / 03/ 180/ 0/02/ Dotto 3/2/20

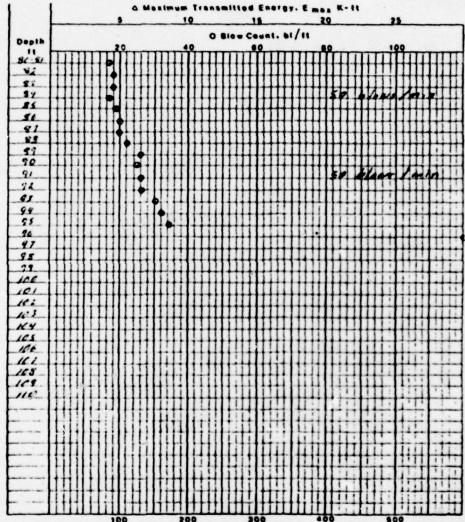
PILE DRIVING MEASUREMENTS
PILE NO. ___21_

First Sequence No.



WCC. Y7C825. Phase IZ WOL 电A

WOODWARD-CLYDE CONSULTANTS 100 0 000 LOCKS AND DAM NO. 26 1.0. No. 09 03 Date 3/2/7 PILE DRIVING EFFECTS TEST Operator PH PILE DRIVING MEASUREMENTS Time Sequence No. PILE NO. _________ First . Finish. 11 20 O Blow Count. bi/II Depth



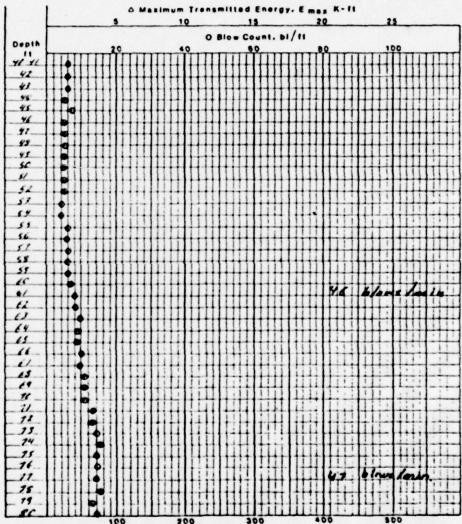
WCC. Y7C025. Phase IT IVEL TA

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 I.D. No. 09 05 180 PILE DRIVING EFFECTS TEST Operator_AZ Sequence No. PILE DRIVING MEASUREMENTS PILE NO. _ 03_ O Blow Count. bi/II Depth 4 10 12 14 15 16 11 15 14 15 16 11 18 O Maximum Driving Force. Fmag. Kips

WCC. YTCO25. Phose IT SVOL BA

1.0. No. 09 03 190 0 0562 Date 3/1/29 Operator 67

PILE DRIVING MEASUREMENTS PILE NO. 21 First _____

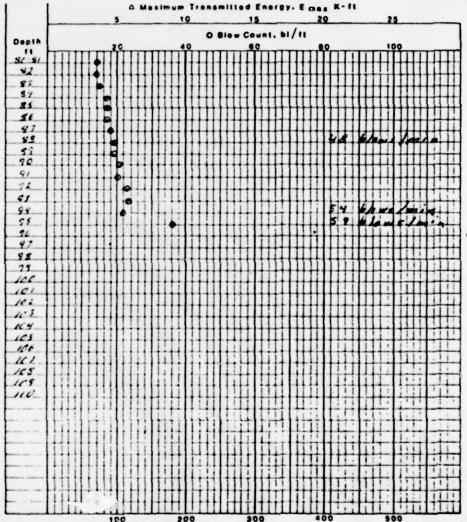


WCC. Y7C825. Phose IZ | VOL EA

1.0. No. 19 AT 180 0 035 Date 3/3/75 Operator A2

Operator_A.s

Finish _____

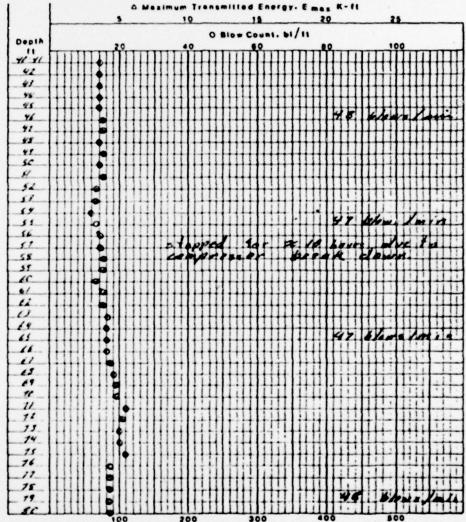


WCC. Y7C825. Phose IZ ; YOL I A

180 0040 LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST Doto JIZZ Operator MA Sequence No. PILE DRIVING MEASUREMENTS PILE NO. 44 O Blow Count. bi/ft C-1 4 11 15 14 15 11 11 14 15 16 17 18 17 30 31 12 34 35 11 15 O Maximum Driving Force. Fmas. Kips

WCC. YTC825. Phose TI; VOL II A

WOODWARD-CLYDE CONSULTANTS

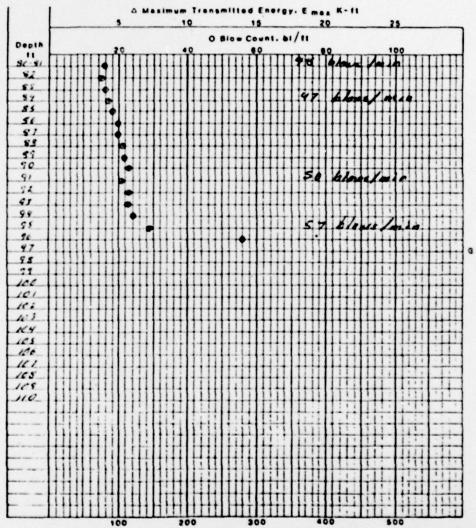


WCC. YTC825. Phase If just I A

I.D. No. 09 03 180 0 6400 Date 10/2

Operator_If

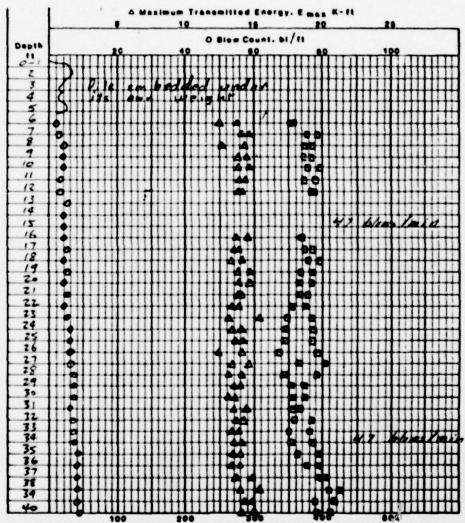
First Sequence No.



WCC. Y7C825. Phase IT ; VOL EA

1.0. No. 09 03 180 0 050 Date 3 Mar 71 Operator JEL

PILE DRIVING MEASUREMENTS PILE NO. #05 First 1846 0501
Finish 23:56 0504



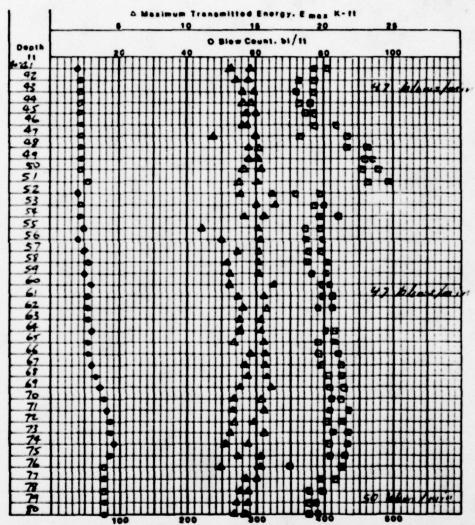
WCC. Y7CO25. Phono E SVOL II A

1.D. No. 09 03 (80 0 0 050)

Doto 3/3/77

Operator 1754

PILE DRIVING MEASUREMENTS PILE NO. 405 Timo Soquence No.

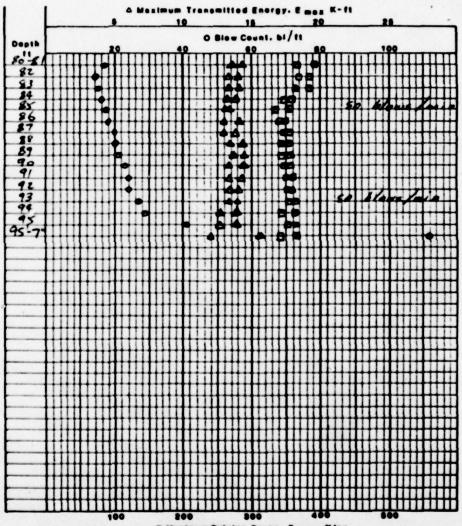


WCC. Y7C825. Phoso E j VOL TA

Doto 3/3/79
Operator 354

PILE DRIVING MEASUREMENTS
PILE NO. # 5

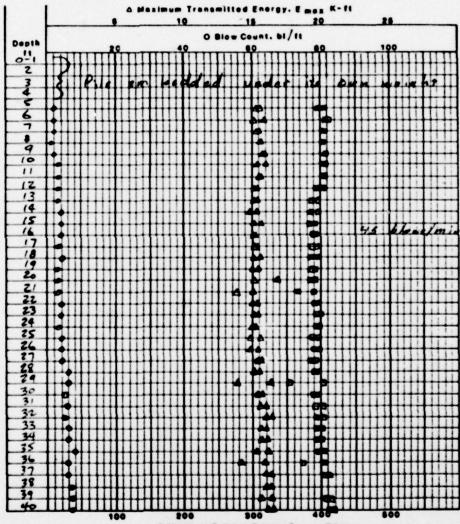
First ______



WCC. Y7C828. Phone E , WL E A

1.0. N. 09 03 180 0 0600 001.3/L/M

PILE DRIVING MEASUREMENTS PILE NO. 06 15 M3 First 14:35 0601
Finish 060

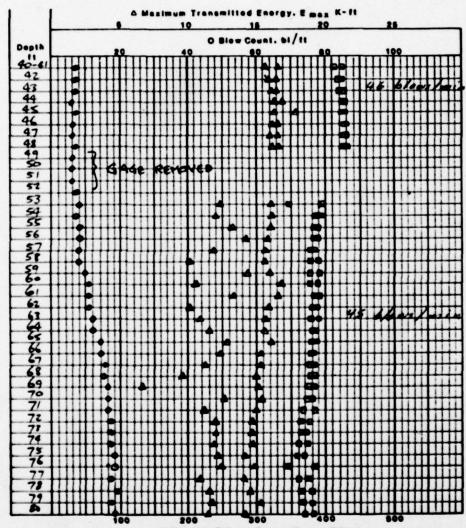


WCC. V7C825. Phoso E ; Vol. E A

1.D. No. 09 03 180 0 0600

Operator_

PILE DRIVING MEASUREMENTS PILE NO. _06_ Time Sequence No.



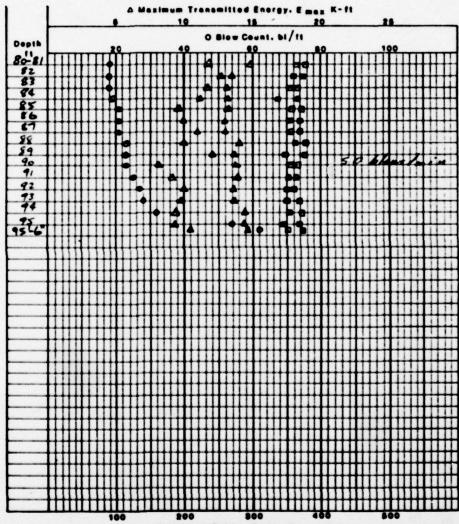
WCC. Y7C826. Phase E ; VOL TA A

1.0. No. 09 03 180 0 0600

Operator.

PILE DRIVING MEASUREMENTS PILE NO. _______

Time Sequence No.

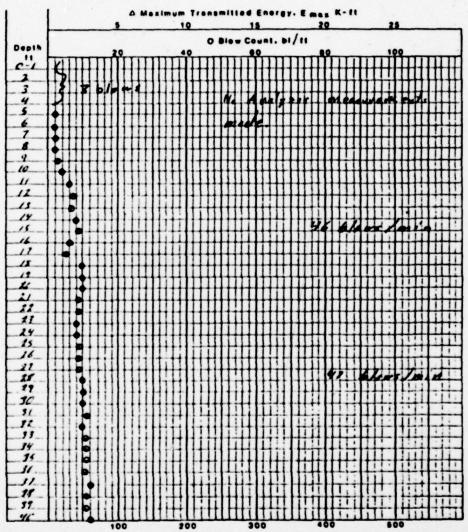


WCG. YTCOPS. Phono E ; VOL BA

1.0. No. 09 /09 / 180/ 1 Operator AA

PILE DRIVING MEASUREMENTS PILE NO. _07_

Sequence No.



O Maximum Driving Force, Fmez. Kips

WCC. YTCB25. Phase IT SWIL EA

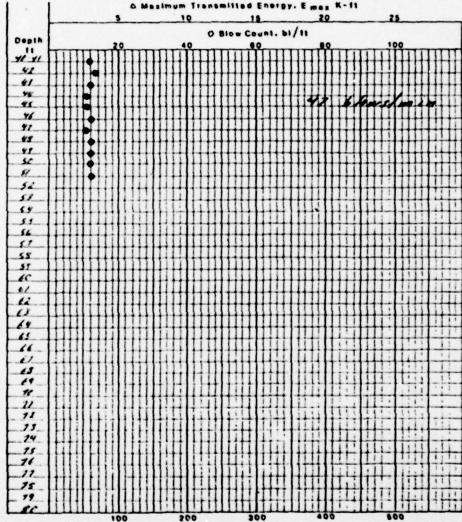
Sequence No.

WOODWARD-GLYDE CONSULTANTS

LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST 1.D. No. 09/03/180/1/0200 Doto 3/6/20 Operator 04

Time

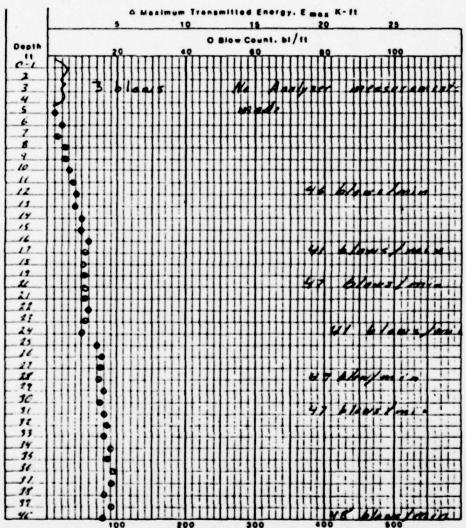
First ____



WCC. Y7C825. Phase TZ ; Vo. BA

1.D. No. 09/03/180/1/0800 Doto 4/1/2: Operator AZ

PILE DRIVING MEASUREMENTS PILE NO. __08_ First Sequence No.



WCC. Y7C825. Phase IT ; Vot MA

P. 2 01 3

1.0. No. 09/03/180/ 1/0800 -- LOCKS AND DAM NO. 26 Date_ 4/2/19 PILE DRIVING EFFECTS TEST Operator AZ Sequence No. PILE DRIVING MEASUREMENTS PILE NO. _ #8_ O Blow Count. bi/tt Depth ** 4C .1 a il O Maximum Driving Force. Fmas. Kips

WCC. YTCO25. Photo EZ ; VOL II A

WOODWARD-CLYDE CONSULTANTS

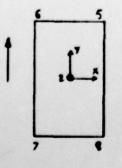
N.6 ABSOLUTE DISPLACEMENTS OF MONOLITH M3

The absolute displacements of monolith during prototype pile driving, presented in Table N.I are with respect to the bosition of monolith, completely unloaded, Gefore prototype pile driving.

The absolute displacements of monolith, presented in Table N. 2 are with respect to initial monolith position before preloading (no load applied); therefore, these displacement values represent total monolith displacements throughout the tests.

0302	165	\$ 40.3	477	1.058	1.125	1.158	1083	1.106	-0390	-
3/03/14.00	303/16:08			1019	1091	1119	1.038	1049	-0.380	
0305	181	261.3	47.4	1.137	1 197	1256	1.209	1.213	-0480	-
303/18:00	3/03/20:30			1.090	1.095	1295	1.157	1.142	-0.443	-
0402	112	242.8	474	1180	1232	1309	1266	1.247	-0510	-(
3/03/93:20	3/04/01:37			1.130	1.120	1970	1199	1.180	-0.503	•
0403	532	21,1.8	47.6	1.202	1257	1.334	1858	1266	-0.500	_
3/05/08:00	3/05/09:30			1-137	1.130	1883	1.200	1188	-0.497	-
0405	549,	240.3	47.7	1279	1339	1414	1.335	1.342	-0.540	-
3/05/16:30	3 05 15 57			1-179	1.178	1.356	1.268	1250	-0.538	-
0502	562	2:8.4	477	1.288	1.360	1393	1298	1.335	-0.570	-
3/05/22:00	3 05 /23:10			1.217	1199	1.352	126	1.258	-0.536	
0504	570.	240.8	472	1307	1.374	1.481	1399	1.390	-0.600	-
3/06/00:30	3/06/01:31			1 246	1.233	1.436	1.331	1.311	-0581	-
0504	626	240.8	47.6	1365	1437	1 535	1.461	1.449	-0650	-
3/06/08:00	3/06/08:19			1281	1.266	1459	1378	1346	-0621	-
0504	635	249.2	47.7	1.412	1.469	1.519	1.462	1.466	-0.675	
3/06/12 00	3/06/13:29			1.334	1303	1454	1386	1.369	-0.617	
0604	648	195.6	47.5	1.450	1.478	1.556	1.502	1.497	-0.660	
3/06 /16:00	3/06/16:49			1341	1 310	1.505	1.417	1.393	-0644	
0606	655	119.4	47.8	1.572	1.608	1.712	1.648	1.635	-0.750	1000
3/06 /21 00	3 06 / 22 35			1473	1442	1.650	1.564	1.532	-0.770	
0703	665	128-8	476	1777	1. 320	1.915	1823	1.834		
3/07/00:30	3/07 / 01.31			1.625	1622	1794	1701	1.685	-0.861	-

٧.	Compon	int is .				Z.	Compon	ent, in-			
	7		7		•	88	,		78	7	Romarks
			ptical Su								
	4300	2007	0.886	Cyber D	-0.530	-0.545	0.000	-0.070	0.035	0.11.0	
-	0.881	0.813	0.834	-0929	-0903	-0 218	+0 005	-0.060	-0.035	-0.140	
	0969	0814	2 709	-0.270	-0.840	-0 255	020 0-	-0.000	-0.050	-0.153	
-	0.915	0.840	0.857	-0951	-0995	-0838	0.003	-0.067	-0.039		
	1.074	0165	0 994	-0.300	-0.270	-02.85	-0.050	-0.110	-0.030	-0183	
-	1101	0.161	0 184	-0340	-0839	-0 290	-0.065	-0.093	-0.079	-0.184	
	1 082	0974	300.	-0290	-0.280	-0 285	-0.070	-0.150	-0 110	-0.198	
				-0.307	-0294	-0276	-0.084	-0.120	-C 102	-0.189	
	1130	1.055	1.077	-0 290	-0.320	-0.305				-0233	No reading of 28
	1301	0.996	1.017	-0.319	-0 280	-0 300		-0125	-0.119-	-0806	
	1.127	1020	1-059	-0.380	-0360	-0.370		-0160	-0130	-0250	
_	1069	0986	1 005	-0364	-0.391	-0.342		-0.137	-0115	-0 229	
_	1.158	1.053	1-106	-0390	-0 360	-0375	-0 100		-0135		
-	1119	1.038	1049	-0.380	.0333	-0 351		-0.158	-0.134		
-	1256	1.209	1-9.13	-0480	-0440	-0460		-0 250	-0.195	-0.328	
	1295	1157	1 142	-0.443	-0.391	-0 417	-	-0.191	-0171	-0294	
	1309	1266	1-247	-0510	-0 480	-0495	-0.167	-0280	-0.220	-0.358	
	1.334	1858	1266	-0.500		-0485					
,	1283	1 200	1188	-0.497	-0470	THE PERSON NAMED IN COLUMN TO PARTY.	-0.186	-0230	-0215	-0.350	
	1414	1.335	1.348	-0.540	-0510	-0525		-0 290		-0378	New calibers used from
	1-356	1268	1250	-0.538	-0477	-0508	-0199	-0 248	-0224	-0.366	this sequence on
	1393	1298	1.335	-0.570	-0.540	-0.555		-0330	-0270	-0413	THIS SEQUENCE ON
	1 352	126	1.258	-0.536	-0479				-0257	-0 382	
	1.481	1399	1390	-0.600	-0.560	THE RESERVE THE PERSON NAMED IN	-0280	-0 370	-	-0.453	
Š	1.436	1.331	1.311	-0581	-0.518		-0301		-0 380		
L	1535	1.461	1.449	-0650	-0620	-0635	-0840	-0380	-0 310	-0473	
	1459	1378	1346	-0621	-0.553	-0587	-0 221	-0881	-0251	-0419	
	1.519	1.462	1.466	-0.675	-0620			-0 255		-0430	
3	1454	1336	1.369	-0.617	-0575	-0.596		-0 844		-0407	
3	1.556	1.502	1.497	-0660	- 0.630	-0645		-0 290	-0230	-0438	
2	1.505	1417	1.393	-0644	-0593	-0619	designation of the last of the	-0 247	-0215		
2	1-712	1.648	1.635	-0.750		-0.735		-0.350		-0.510	
2	1.650	1.564	1.532	-0.770				-0427		-0 54	
1	1915	1313	1.685	-0.861	-0.170	-0.810	-0130	-0310	-0275	-0543	
	1.952	The state of the s	1.862	-0920	- 0.870	-0.895			-0 280		
L	1-239	1.356	1.765	-1.041	-1.044	-1.049	-0 231	-0303	-0 267	-0.655	
5		2.123	2.101	-1.070	-1.080	-1.075	-0990	-0370	-0.995	-0.685	Ainter mal Punctionning
5	2 057	1.979	1947	-1.098	-1.029	10/1	1 0000	0 300	2004	0 603	(ne value of V)



ABSOLUTE DISPLACEMENTS

OF MONOLITH M3

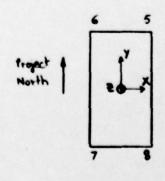
DURING PROTOTYPE PILE DRIVING

FOURDATION INVESTIGATION AND TEST PROGRAM. ERISTING LOCAS AND DAM No. 50 ST LOUIS DISTRICT, EGGPS OF ENGINEERS.

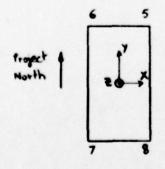
Madeira Chia Communi

Table N.I

		Hor	contal d	splacement	, in-		
Displacements	5	6	7	8	Amage	5	1 6
					eference por		eler dot
at the end of preloading (monolith axially and							
laterally unloaded)	0.576	0.626	0 650	0.573	0 606	0.133	0 13
prior to prototype pile driving (monolith axially and							
laterally loaded)	1.375	1.450	1.531	1.386	1.436	0.431	0.33
at the end of prototype pile driving (monolith axially and		The same of the sa	10 M T - 20 M T				
laterally loaded)	2.474	2.481	2.707	2 552	2.554	1.297	1.164
prior to load testing							
(monolith axially and			-				
laterally unloaded)	1.707	1.741	1917	1.802	1.731	1.031	1.00



Hor	zontal de	splacement	, in.			Settlemen	t, in.			
	7	8	Awrage	5	6	North Average	7	8	South Average	Average
			firence point		der dota					
	0650	0.573	0 606	0.133	0 135	0.167	0 001	0 054	0028	0.037
0	1.531	1.386	1.436	0.431	0.338	0.385	-0.001	0.114	0.057	0.221
		Mary 100 Milesan 1000								W
	2.707	2.552	2.554	1.297	1.164	1.231	0 276	0.376	0.326	0.778
	1917	1.802	1.731	1.031	1.001	1.046	0 231	0.458	0.375	0.711



ABSOLUTE DISPLACEMENTS

OF MONOLITH M3

FOUNDATION INVESTIGATION AND TEST PROCEDAM EXISTING LOCAL AND SAW No. 20 OT LOUIS DISTINST, COAPS OF COMMESSES. DASTIGO-TO-8-0005

Weedward Chair Committents

Table N. 2

Y7C-825 Phase IV; VOL TIA

N.7 INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR PROTOTYPE PILES OF MONOLITH M3

Monoliths M3/7 Prototype Pile No. | Pile Type HP 14x73 Final Pile Penetration 106.6 ft

****	000 Bo.	0	10	,	1	10	2	6	10	7	0	10		0	NU	•
PHO POO	trattes M	1	"	- 11		25	,		52	,	;	70'		4	10'	
Seesel	******	1	I	:	1.		:	I.	I	:	I.		:	1	I	1
•																
	Lau		Y	1	_	V	_		V	1		Y			V	1
	74		1	_		_	1		1		_					L
•	MZ	_	_	-	_	_	-	_	-	_	_		_		_	L
•			_		_		1	_	_						1	L
•	M3				_	_	_									L
,	FL		X.			X			X			×			×	
•												1				
•	F2		X			X			X			X			X	
10	G4-15			\mathbb{Z}			X			X			X			X
11	13		X			X			X			X			X	1
10	64-50															
10	67-1		X	_		X	1		X			X			×	1
14	G12-1		Y			V	x		V	X		V	X		V	
10	67-15			X			X			X			X			1
10	G12-15															
17	67-50			X			X			X		•	X			2
10	G12 - 80															

Monoliths M3/7, Prototype Pile No. 2. Pile Type HP 14x73 Funal Pile Penetration 95.6ft

*****	Bo.	0	20	t.			2		20	3	p.le	
PRO POS	M- 00010 10		4			2.	-		s		45'7"	
Spanne!	******	1		:	1		:	i	I	:		
		_	-	_	_	-	_	_	-	_		
	MI	_	Y		_	Y	_		X	100		
:	14	_	_	-	_	-	_	_	-	X		
	712	-	-	-	-	-	-	-	X	-		
•		_	_	-	_	-	_	_	-	-		
•	MS	_	_	_	-	_			X	-		
	-	_	_	X		_	X		_	0		
•			_									
•	12		,	X			X		Y	0		
**	C6-15			Y			文			Q		
••	73		X			X			Y	X		
11	04.30											
**	67-1		X			X			×			
14	64-1		Y	X		V	X		0	0		
10	67-05		7			X				X		
10	64-15											
17	07.50		5.0			X			0	X		
10	m1-50											

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component

y component

a component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

INFORMATION ACQUIRED BY

DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITHS MA PROTOTYPE PILES No. land 2

Monoliths M3/7 Prototype Pile No. 3 Pile Type HF 14x73 Final Pile Penetration 95.7 ft

*****	No.	a	30/		0	30	2	0	30	3	0	30		0	30	5
PHO P	tration H		2'			25	,		52			70		8	0	5
Joseffe a Bos Ebasset	4 No.	8		:	1	I	:	8		:	8		:	8		:
•																
	MI		V			V			Y			X			V	
•	M4												X			
•	MZ									1		X				
•																
•	MS											×				
1	F1			×			X			×		V				
•																1
•	12		4	×			X			×						X
10	66-15			×			X			×						×
11	73		X			X			X				X		X	
18	66-50															
10	67-1		X			X			X			×			X	
14	612-1		V	×		V	X		V	X		V			V	1
10	67-15		X			X			X				X		×	
10	64-15															
17	07-50		X			X			X				X		×	
10	41-50															

Monoliths M3/7, Prototype Pile No.4, Pile Type Funal Pile Penetration 96.1 ft HP 14×73

****	••• • •.	1	94	•1	0	10	2	0	40	2	0	40	4	04	195	-
PHO P			4'1		1	s'a	•	3	si'	3.	3	7	0	7	5%	60
Second Second		8		:	Ž.		:	1		••	1	I	1	1		:
- 		-	V	-	-	V	-	-	X	_	-	V	_		V	-
	M4		-	-	-	-	-	-	-	X	-	-		_	-	
-	ME	-	-		-	_		-	X		-				1	-
•			-								-		-			
•	MS		1	-	-		-		X			-				
,	FI		1	X		-	X	NUMBER OF STREET	V		1					7
•								-				•				
•	12		1	X			X	4	800		-					=
10	06-15			×												X
11	73		X			X			V	X		X	X		X	
11	66-30		1													
18	67-1		IX.			X		_	X			X	X		X	
**	612-1			X							d	Y			Y	×
**	69-15						X			X.		X	×	_	X	-
10	67-15		-	_				-	_	_	_		-	-	_	-
17	07.50		_				X			X	_	X	X		X	
10	W1-50														1	

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component

y component of component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITHS M3/7 PROTOTYPE PILES No. 3 and 4

Monoliths M3/7 Prolotype Pile No. 5 Pile Type HP 14x73 Final Pile Penetration 95.6 ft

****	No.	1	250	1.		50	2		30	2		50	4	7.16
PHO PO00	tration It.		5		:	25	3-		5	,		75	-	45'7
Jecotice Bos Ebecci	******	8		:	8.	1	:	į	1	:	Į.	I	:	8
-		_	-	_		V	-		-	_	_	_	_	
-	MI	_	V			1		_	X			-	1	
	M4	_		X	_	_	X	-	1	X	_	-	X	
•	MZ	_	_	-		_	-		X		_	-	-	
•			_	_			_				_	-	_	
•	MS								×					
,	FI			×			×		V				X	
•									,					
•	-		-											
10	66-15			×			X							
••	73		X			X			V	X		X		
11	66-50													
18	67-1		×			X			X			X		
14	612-1			×		×	X							
10	67-15		V			X				X			X	
10	6/2-15								-					
17	07.50		X			X			-	X			X	
10	611-50													

Monoliths M3/1, Prototype Pile No. 6. Pile Type HP 14x73
Funal Pile Penetration 95.5 ft

	*** **.	-	101		-	*		0	60	,	0	60	1		606	_
Pue Peed	tration M		4		1	ما		3	15		5	7'	,•		75	-
Spacet	*******	1		:	1		:	į		:	1	I	•	1		:
•																
•	MI		Y			V			V			X			Y	
•	M4			X			K			X			X			X
•	7/2							_	_			X	_		_	_
•		_						_	_		_	_	_	_	_	L
•	MS											K,				L
,	1 1			X			×		_	X	_	Y		_	_	K
•									_					_		L
•	-	_														
**	G6-15			×		_	1		_	X		_	_	_	-	
**	73		X			X			X	_	_	Y	X	_	X	┖
**	06-30	_	_	_		_	_	_	1		_	١,		_	_	1
18	67-1		X	_		X			X,	· manerien	-	X	_	_	X	_
14	612-1		V	K.		V	X			IX.		-	_	_	Y	IX
10	69-15		X			X			X			_	X		X.	L
10	6R-15	_	_					_	1	_		_	_	_	-	-
17	07.50		X			X			X.		_	_	X		X	_
10	01-50															

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component y component component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION

SYSTEM FOR MONOLITHS M3/7 PROTOTYPE PILES No. 5 and 6

Monoliths M2/= Prototype Pile No. 7 Pile Type HP 142 35 Final Pile Penetration 53.25.25

****	#0.		70	1.		076	z		> 70	3		•		
PHO POOR	tration -H		2'6	."		2	•		3	•	50.	3''		
Jecolice Bee Ebeccei	6	8		:	8		:	8		:	8	:	2	:
•														-
	MI		V			V			V					
•	M4			X			X			X				-
•	M2													-
•														
•	MS													
1	F1			X			X			X		-		
•														-
•	78		Y											_
10	66-15			X			X			X				-
11	73		X			×			X					
11	64.50													
18	67-1		X			×			×					
14	612-1		V	X		V	×		V	X				
16	67-15		X			×			X					
10	67-15													No.
17	07.50		X			X								
10	01-50													

Monoliths M3/7, Prototype Pile No.8, Pile Type PP 14 x 0.375 Fund Pile Penetration 50.75 ft

Pue Pesetreties H		0801		25									
		3'10"				50'9"							
20001100 Bod Ebgodel	******	1		:	Ž.		:		:	Î.	1:	1	
•				-			_	-			-	-	tomorphic to a pitch
	MI		Y	1	_	Y		-	-		-	1	
•	M4			X			×			_		_	
•	MI					_			-	_		_	
•				1						1_		1_	
•	MS												
,	FI			X			X					T	
•	1			1								T	
•	173		_	_									
10	66-15			X			X						
**	73		×			×							
11	64-30											I	
10	67-1		×			×						T	
14	612-1			IX		V	×						
16	69-15		X			X			-		-	T	
10	64-15										-	T	
17	07.50		X			×					-	T	-
10	01-50							-	-	1	-	1	

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

T x component

y component

a component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITHS MY PROTOTYPE PILES No. 7 and 8

Y7C-825 Phase IV; Vol III A

N.8 INFORMATION DIGITIZED FROM ANALOG MAGNETIC TAPE FOR MONOLITH M3

Geophone No.	Prototype Pile No and Depth of Digitization (ft)										
	1	2	3		5	6	7	8			
G7-1		50	55			50 70	50				
G7-15		50	55			50	50				
G7-50		50	5 5			50	50				
F3		50	55			50					
MGI						70					
MG2						70					
MG3						70					

Depth of Digitization is the prototype pile tip depth at which the digitized data recorded during the tests on analog imagnetic tape, were processed through a computer.

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION DIGITIZED FROM ANALOG MAGNETIC TAPE FOR MONOLITHS M3 & M7

FOUNDATION INVESTIGATION AND TEST PROGRAM
ENISTING LOCKS AND DAM No. 26
OT LOUIS DISTRICT, CORPS OF ENGINEERS.

DACE43-70-6-0008

Western Capta Commitment

PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDIX O
MEASUREMENT DETAILS
MONOLITE M5

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Y7C-825 Phase IX; YOL III A

O MEASUREMENT DETAILS, MONOLITH M5

QI COMPLETE FIELD LOGS OF INSTALLATION OF TIMBER PILES UNDER MONOLITH M5

The identification number (Id. No.) at the top right-hand corner of each data sheet includes the timber pile number shown in Fig. 5.2, Volume III.

The timber pile number is given by the two digits

Preceeding the last two zeros of the Id. No. (for example, page 0-2 corresponds to timber pile No.44)

The field logs are presented in chronological order of timber pile installation.

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST MLE DRIVING RECORD

TOH. 08 05 160 1 4400

Time 18 10 15 10 10

Inspector - D Astonia Pile Type Dovales for Pile length 42' Ground al. trench level Vulcas VI Hammer 15,000 ftbs Time Energy. . openting Rate 60 bl/min

Debay .	Bioms	Remorts	0 D.		3		cs		-	-		-	10	-		*	
Ci	-		177	10	-	-	20	-	-	-		10	111	-	in	-	4
0-1	-	1110 Prejetted to 21'	111	+	11	+	+	+	+	+	+	+	+	+	+	+	-
	-		1111	4	11	11	+	1	1	1	Ш	4	1	+	+	+	4
		The policities to 17 6"	111	1	H	11	44	1	1	Ш	Щ	Н	-	H	Н	44	4
4		under the own weight	111		11	11			Ш			Ш				11	
,				П	П				П								
•			. 1 1 1	I	П								11	П			
2			111	П	П	T			ı		- 1						
•			111	T	П	П	T	П	u			11			ш		
. 5			111	П	П	T	T	П	п	ш	m	11		П			
			111	T	H	11	11	T	n		П		11	П			1
	1		1	Т	11	T	1	T				П	IT	П	T		٦
	1		1 .	1	11	Ti	1	T						П	T		1
			7.7	1	11	1	1	1	1			T	11	IT			1
		O		+	-	11	+	1	1 2		11	1	1				1
-14		Organie matter seen in	3 1 1	1	1	1 1	+	T	11	1	1	1	11	11	1		1
15		setion wash 14-11 days		+	-	-	+	+	1	+		+	1	11	1		1
-14	1	71	-	+	-	-	+	+	1	1	1	+		11	1		1
-17		Pile emboded to 17.8"	5	+	-	-	+	+	11	-	-	+		1	1	1	1
1_		11 ZP After 3 blem sile	5	+	-	-	+	+	+	-		1	7.7	1	1		1
19		had made of by	0	+	H	+	+	+	+	-		+	1	11	-		1
		Tetted on east side to 22"		+	4	-	+-	+	+	-	+	+	-	+	-	-	-
L	-	Clay scare and Isness in	-	+	-	-	+	+	1	+	+	+	-	+	-	-	1
11	-	was word 20-25 days	-	+	-	1	+	+	-	-	-	+	-	-	-	+	-
	-		-	+	-	-	+	+	4	+	_	+	+	-	-		4
14	-	Pile seak		+	-	-	+	+	-	-	_	+	-	-	-	-	-
11	1		-	+	-	-	+	+	+	+	-	+	-	-	+	-	4
14	5		10	4	-	-	+	+	+	4	+	4	-	+	-	-	H
1/	1		10		11	-	+	+	1	4	+	+	-	11	1	-	4
21	9		1	브	1.1		1	1	1	1	1	1		1	1	1	
	2.8		1	4	1.1	-	1	1	0	Ц.	1	4	1	_	-	_	J
	34	18:46	1	4	11	•	1	1	4	110)	4	1	1	1		Ц
21	43		1 1	4		멀		1	1	4	-	4	0	1	1	1	Ш
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1)	56		11	1	1	<u>BY</u>	_	1	1	1	11	4	L	11	1	0	Ц
34	53		11	4	11	-6	_	1	1	1	4	4	11	11	TIO	1	Ц
1.	20/4"	19:10	1 . 1	1	11	10	بالا	1	11			9	11	11	1	1	
	alec	restrice 11/2/18	1 1		11			-	_		1	1	1	11	11	Ш	
	,	1 10 20 A4	1 :			1		1	1	1		1		11	1	Ш	
			1		1		1						Ш	11	Ш		J
			1	I	1	11	L						Ш	Ш	11	Ш	U
					1	LI		1						11			J
			-	50		-	100			-		20	-		2		

01 (304) 30 347.34 Pile Enter at EAD. Pastrice V Jetting depth Hed 4.0%.E

WCE, YTE BIS, Phase TE

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 08 05 160 1 4300

Pile Type Dauglas Fir Pile length 42' Growd al Treat text

Yulcan VI Opening Rate 60 blustoin

Date 11/78
Time 19:55
Inspector - D. Amarca

Ci Ci	Blows	Remorts	0 2	20	4	5,	20	at	10	•	40	10			
-	+	 	TT	TT	TT	IT	m	TT	ĬΠ	TI	TŤ	П	III	TT	TI
0-1	+-+-		111	T	11	11	ш	11	Ħ	11	11	IT	П	T	11
Name and Post of the Owner, where the	i 	18 431 031	ttt	11	11	1	Ħ	11	Ħ	11	11	11	П	11	11
	++-	Fre- which to 27	tit	T	#	1	H	11	ĦĦ	11	11	IT	т	111	Ħ
1		Organic on Her (grace!	+++	₩	#+	+	H	++	₩	++	H	++	Н	++	н
		Size pera of lank)		++	++-	+	+	++	+++	++	₩	++	Н	Н	H
		in return and when yet	+++	11	++	+	++	++	+++	+	H	++	H	H	H
		the between 15 and 18	+++	11	++-	+	++	++	₩	++	₩	H	Н	++	++
•	1	1 (m)	11	++	#	+	1	++	##	++	#	H	H	Н	H
	11		111	4	11	4	111	#	!++	++	₩	#	Н	Н	H
		Pik run to 19'	1	1	++	1	11	++	111	++	#	++	Н	++	Н
11			1	1	++	1	1	11	111	11	#	1	1	1	+
11	1	-	111	+	+	1	1	++	1	11	11	1	+	11	+
-11				1	11	1	4	11	11	1	4	1	11	1	+4
14				1	1	1	1	4	+	-	+	1	1	-	H
13				- 1	11	11	1	-	11:	_	#	1	11	44	11
14			11	1	1	1 -	1	11	111	11	11	1,	1	44	+
.1		1	-	-	11	1	4	11	111	11	#	11	11	11	+
16			11	1	11		1	11	11	-	1	11	-	41	+
19	I Y		11	- 1	11	1	11	11	11	11	#	1	1	-	+
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11	2		0	1	and the same		1	11	111	11	4	1	11	11	1
ü			0	1		1	1	11	111	1	11	11	11	1	1
24	2		0	1	1		1	11	111	-	11	11	11	1	4
11	13		0	11	1		1	11	111	-	11	11	1	11	1
16	12		1	1	0		1	11	111	1	1	11	11	11	1
u	31	58 Huston	1	1	1	1.	1	11	P	1	1	-	11	Ш	1
24	145		1.		1	1		11	Ш	_	11	10	11	11	4.1
	38				1		1	1	Ш	_	1	11	1	1 1	_0
20	60		1	11	11	1	1	11	ш	1	11	11	11	11	1
24	75		1	1	1	_	1	1	Ш	1	4	1	11	11	1
31	30	52 bleefor, set - set tonto		11	11		4	11	111	+1	11	11	11	Щ	1
"	58	2911 . Barbar 12'- 36'	111	11	Ш	<u> </u>	1	1	Ш	11	11	1	11	Ш	10
24	44		1	11	11	TC	-	11	111	11	11	14	θ.	111	1
35	18 6. 1.	Pile tool 3565'	11	1	11	L	4	11	111	10	1	11	11	Ш	1
	25 for 1"	Restrict to b 3560' a	1	11	1	1			4	11	4	11	11	Ш	+
		11/2/79 . From 1 B/c : 106 black		11	1	1	11	11	111	11	11	11	11	Ш	+
			1	1	1	LL.	4	11	44	11	#	11	11	Ш	+
	-		1	1	1	11	ш	11	44	44	#	11	11	Щ	4
				1	-	11	1	11	1	П	П	Ш	Ш	Ш	L
01 00	A)	ments yes 22 (-34-5 Notes: EFE A35 Pile metter at	2.0			2	-	1	2						
		= 5.1%s			•	-	-					/	4	1	!

WCC, YTCBIS, Phase II A

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

FON. 03 05 160 1 4200

Hammer VulcacVI
Energy 15000 ft lbs Prie Type Douglas Fir Prie length 42' Grand al Treat Acrel 11/1/18_ Date Time 12 10 Empeter - D. Agairus

Depth	Blows	Remarks	· Bestile 20 10 40 50	
0-1	1			П
-	1 1	Pre- jul 1 27'		III
i	1	111 36: 3 21		ITT
-	1	Pik run + 27' Hen		Ш
	++-		 	H
	+	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		H
	+	free for to the first and	- - 	Ht
		D1 - 1 - 5'		H
•	++-	Pik re-reg to 15'		H
		you fille use it when		H
		with the same of the same		H
	+	Tune		H
-11	+			111
-11	+-+-			H
14	+-1-			111
13				H
	+		6 H H H H H	111
	1 2			1
1_	1 2			111
19	11	-		111
10	++			111
L	1 3 1			
-11	+		- 	+++
LI	++			111
1.	++			111
	1-			-
- 11	8			1
1/	111			1
	12		0	-
- 11	12		o	1
٠.	15		to of the	11
31	52			111
- 11	58	57 Nove / no		1
34	65			11
33	261	* 1		III
	-	Restrike , to to 150 0'		H
		11/2/29 . Fire Ok : 125 Har/4		111
	1	1		П
				Ш
	1			П
01/12/	1	Coth for Notes:	Capacity, kips Restricte	
	:	2.9%, 5	V Jetting dapth Il	1

VOL TA

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PLE DRIVING RECORD

P. 1 - 1 TON. 03 05 T60 7 410

Pile Type Drughe For Pile length 42' Ground al. Trevil Aud Hammer Willow VI Date 11./78

Energy 15,000 ft lb Time 23 15 b 24 00 to
Openting Rate 6. Bloom Impuber D Americal

144 ·	Blows	Remarks	Dr.		20	34	-	^=			10			
64			-		-	-		0	-	40	-	-	-	-
0-1			1111	111	Ц.	11	111	44	4	1	щ	4	44	#
-		Parjet hole 10 25	1111	111	11	1	ш	11	11	Ш	щ	ш	11	#
		the endeated 19	1111	Ш	Ц.	Ш	ш	11	Ш	Щ	Щ	щ	11	#
•		under its own wit	1111	111	11		Ш	11						Ш
1			111	III	П			П		ı		п	Ш	П
	1		1111	III	II		œ	II	1	11		ш	Ш	П
2			1111	TIT	П	П		П	11	11	n	88	Ш	П
•			1111	Ш	П	П	Ш	П		11		11	Ш	П
.1			1111	111	11	П	П	T		I	Ħ	Ī	П	П
			1111	111	11		H	1	П		П	П	П	П
	-		1	111	T	Т	11	T		ī	П	Т	11	11
"	-		11.1	111	11	T	11	11	1				11	Ħ
-				111	1		TT	1			T	T	1	Ħ
11	-	in him and some	1	111	11		11	1	-	1				11
15		seen in solar week of		111	11		11	1	1		11	1	11	11
The company of the last	-	10 h 17 445	71 1	111	1		11	1	11	1	1	+	#	11
14	-	P 10 -10-	1	117	+		1	1	1		-	1	11	11
The same of the same of	+ +		1111	11:	1		11	1	1		T	T	11	11
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11		an malla seen	1111	111	+		11	1	П			T	11	11
10	13	alound 20-12 dift.	1	111	1		T	1	1	1	T	T	11	11
4	-		-	+	7	-	11	++	11	1		1	11	++
11	+		1	+	+	-	11	1	-	1		1		Ħ
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11	15		1	TE	51	T	11	11	-	Н		:	11	11
14	18		1	17	0	-	1	Ħ	1			Ť	11	+
12	20		1	+++	10		1	11	+				11	+
28	35		+	+++	-	-	+	+	ਰ	-	-	-	-	+
**	57		-	111	-		11	1	-		11		11	0
3.	74		+++	10		-	-	11	-	+	-	+	11	Ť
21	70		1 11	11	0.0	-	11	++-		+	1	+	T	Ħ
21	72		1111	+++	ō.		1	† †				+	++	11
11	72		1	+++	+	-	11	++	-	+	+	+	+	1
**	25 64 4"		1	111	-	-	1	1	-	+	+	+	++	T
11		4 del a "/4/29 at	1	+++	3		+	+	+	+	+	+	++	11
	36/46	11 25 Au	1	-	-	-	11	1	-	-	+	+	++	+
-			1	++	+	+	++	1	+	+	+	+	++	#
			1	+	+	+	++	tH	+	+	+	+	++	++
-			1	+	H	H	+	н	+	+	+	+	++	+
			<u></u>	lo lo	-	-	-		1	200		4	+	ш
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WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST P. 1 -1 _ TON. 08 05 160 1 4000 PILE DRIVING RECORD 1/2/78 Energy Valcan VI 15,000 A 24. Openting Rate 6 800 /min Pile Type Doughe for 00 30 1. 01 52 Pile length Inspector - Dall Aggrant Grand al. O Driving Resistance -61/64 Remorts Dopth B10-3 • Party 20 40 50 C the jul hade to 25 defet. inch it on waget " .. 15 11 . 7 paton with the in 14 19 mpth 1. My least and salle proper of grander models M 11 .. 1. OI 14 11 42 11 .. 74 30 24 50 Despe .. . 71 " 102 152 34 [G0] 107 19 41 By 67 AL SY Sequence No. Depth to at [ Par ] IL 35 at [ Ash. Tra ] IS 15 at [ Ash. Tra ] O Capecity, Kips 500 ( PA ) 01 ( ABLA 720 Ruhale Pile better of E.O.D. V solling 50% 5 VHEZ. 3 2% E WCE, TICOLS, Phase II A ELON

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WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD FDN. 03 05 160 1 3900

Pile Type Dargh For / Just Hammer Whiten VI Date 11/2/78

Pile length 40 P. Energy 15,000 ft the Time 0715 h all 31

Grand al. Pind Bull operating Rate 10 Boutmin I corporator - 60 given

esth :	Blows	Remorts	:		1			5	*				6	184			*	-
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Or ( profit | 10 - 30 Pile In the of E.O.D. | 10 - 10 Pile In the of E.O.D. | 3-5% E

· Robert

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 20 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

## FDN. 03 05 160 7 3800

Pile Type Drafa File (Tul) Hammer Valor VI Date 11/4/78
Pile langth 42' Energy 15,00 ft the Time 0840 to 10/15
Ground al. Thench that operating Rate 60 thousand Inspector - 68 4/400

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WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS YEST TON. 03 05 160 T 8700 PILE DRIVING RECORD 11/2/78 Vulcan VI Pile Type Douglas fir Date Hemmer 10:25 - 11:36 15000 H-15 Time Energy. openting sate 60 bl/min Tempeter-Green Grand at treach level o Beggine 20 10 Depth Remorts Bions 20 20 40 50 SO 64 to 30 etting 0-1 Material contact " .. it jet 15 111 12 1. 11:06 L 0 11 .. 14 . . 111 14 22 0 31 11 76 28 3. 24 . 040 o . 12/1 34 11:31 restrice 1/2/78 30/1 OI (PDA) 30'-34'1' O Capacity, Kips · Restrice 1.1% 5 P John septh 27%€ wce, TTC BIS, Phase II WIL TIA

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970825 Practil 161 = 1

0.2 SUMMARY LOS OF TATA ACQUIFED DUP IN

PRELOADING MONOLITH MS

MONOLITH(S) TESTED: M5

TEST TYPE: FRELOADING

	Sequence No.	0000	0001	0002	0003	0004
	Date/Time	2/13/19 0700	2/14 0030	414 0120	2/14 0345	2/14 0750
	Description of Event	INITIALIZATEN	V = 80t H = 0	V= 160t H = 0	V=240t H= 0	V= 240t H = 24t
	- Dial Gages, P(1)	~			/	<b>V</b>
•	Optical Horizontal Control. P(1)	~			/	~
DAT	Optical Vertical P(1)	V			V	>
	-Tape Extensometer, P(1)	ref beams only			ref beausimy	ref bases only
PRIMARY	Tilt Meters, P(1)					
	Timber Pile Inclinometers, S(9)	y except				✓ exer No.44
	Timber Pile Slopes, S(9)		-			
	Tell Tales, S(10)	/		/		
DATA	Ground Inclinometers, S(12)	V.				
A	Sondex, S(12)	/				
SECONDARY	Piezometers, S(13)	/			/	/
NOS	- Thermo-couples, S(14)	/	/	V	/	~
SE	Strain Gages, S(10)	-	/	/	-	/
	Record No 02	BALANCE	5	6	7	8
	Record No 03					

MONOLITH(S) TESTED: M5

TEST TYPE: PRELOADING

	Sequence No.	0006	0007	0011	0021	0035
	Date/Time	2/4 0730	2/14 1745	2/s 0000	2/15 1000	2/15 Z100
	Description of Event	V=240t H=48t = Hi	V = 240t H = H1/10	V= 240t H= H1 N = 5	V= 240+ H= H1 N= 15	V= 240t H = H1 N = 28
	Dial Gages, P(1)			/		
•	Optical Horizontal Control, P(1)	~	/	~	1	/
DATA	Optical Vertical Control, P(1)	~	~	1	/	/
	Tape Extensometer, P(1)	ref beams only		ref beams only	ref beams only	
PRIMARY	Tilt Meters, P(1)					
	Timber Pile Inclinometers, S(9)	V evert		√ except No.44	✓ except	
	Timber Pile Slopes, S(9) Tell Tales, S(10)	V		-	-	
4	Surface Settlement, S(11)	1			/	
DAT	Ground Inclinometers, S(12)	V				
A	Sondex, S(12)					
SECONDARY	Piezometers, S(13)	/				
ON	Thermo-couples, S(14)	<b>/</b>		/		
SEC	Strain Gages, S(10)	/		/		/
	Record No 02	9,10	11	12		14
100	Record No 03					

Note: / = Complete set of readings taken

ID No.: 07-05 -MONOLITH(S) TESTED: MS

TEST TYPE: PRELOADING

	Sequence No.	0047	0049			
	Date/Time	216 0800	2/16 1600	10		
	Description of Event	V= 240t H= H: N= 40	V= 0 H= 0			
	Dial Gages, P(1)	~	~			
4	Optical Horizontal Control, P(1)	~	V			
DATA	Control, P(1) Optical Vertical Control, P(1)	<b>V</b>	partial			
	Tape Extensometer, P(1)	ref beams only	ref beam any			
PRIMARY	Tilt Meters, P(1)					
	Timber Pile Inclinometers, S(9)	√ Mo.44				
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	V	/			
4	Surface Settlement, S(11)	<b>V</b>				
DATA	Ground Inclinometers, S(12)	<b>V</b>				
A	Sondex, S(12)	<b>_</b>				
DA	Piezometers, S(13)	V				
SECONDA	Thermo-couples, S(14)	~				
SEC	Strain Gages, S(10)	/	~			
	Record No 02	15	18			
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## 0.3 SUMMARY LOG OF DATH ACQUIRED LINETIG

ID No.: 09-05-MONOLITH(S) TESTED: M5

TEST TYPE: PDET

	Sequence No.	0000	0001	000Z	0102	0104
	Date/Time	2/1479 1900	2/17 0115	z/17 0 <b>80</b> 0	2/17 1130	2/17 1845
	Description of Event	INITIALIZATION	FULL AXIAL AND LATERAL LOADS	FULL AXIAL MID LATERAL LOADS	PILENO I ~ 50ft HALFFENETRATION	PILENO. I ~ 100ft FUL PENETRATION
	Dial Gages, P(1)	<b>/</b>	<b>V</b>	/	~	V
4	Optical Horizontal Control, P(1)	<b>/</b>		/	~	/
AT	Control P(1) Optical Vertical Control P(1)			<b>/</b>	/	<b>V</b>
Y D	- Tape Extensometer, P(1)	<b>✓</b>		~	✓	refbeams anly
RIMARY	Tilt Meters, P(1)	<b>Y</b>		✓	/	1
P						
	Timber Pile Inclinometers, S(9)		<b>✓</b>	,		
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	<b>V</b>		<b>V</b>	/	<b>/</b>
ATA	Surface Settlement, S(11)	<b>V</b>			/	/
DA	Ground Inclinometers, S(12)		/			
A	Sondex, S(12)					
4	Piezometers, S(13)	<b>V</b>		~	/	/
SECOND	Thermo-couples, S(14)	<b>V</b>		<b>V</b>	/	/
SEC	Strain Gages, S(10)	/	1			/
	Record No 02	BALANCE	5	6		7
	Record No 03					

Note: / = Complete set of readings taken

YTC325 Thazel, VoluA

ID No .: 09-05 -

MONOLITH(S) TESTED: M5

TEST TYPE: PDET

	Sequence No.	0202	0204	0300	0303	0306
	Date/Time	2/17 2330	2/18 0250	2/19 0800	2/19 1740	2/19 2300
	Description of Event	PILE NO. 2 ~52ft NUFFERENTIATION	PILE NO. 2 ~ 96ft FULL PENETRATION	PLE NO. 3 START	PILE NO. 3 -51ft HALF RINERATION	PILE NO.3 ~ 95 ft FULL FINETRATION
	Dial Gages, P(1)	<b>/</b>		<b>✓</b>	/	/
•	Optical Horizontal Control. P(1)	<b>✓</b>	<b>/</b>	1	/	V
A	Optical Vertical P(1)	/		<b>✓</b>	/	/
0	Tape Extensometer, P(1)	ret bosons only	ref beams my	ref bosons my	/	/
PRIMARY	Tilt Meters, P(1)	<b>V</b>	/	~	/	/
	Timber Pile Inclinometers, S(9)					<b>V</b>
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)		~	<b>V</b>	<b>V</b>	
4	Surface Settlement, S(11)	J	/	/	~	/
DATA	Ground Inclinameters, S(12)					
A	Sondex, S(12)					
DA	Piezometers, S(13)	<b>/</b>	~	/	/	/
SECONDARY	Thermo-couples, S(14)		~	~	/	1
SEC	Strain Gages, S(10)	~			/	
	Record No 02	8	9,10		11	12
	Record No 03					

Note: / = Complete set of readings taken

ID No.: 09-05 MONOLITH(S) TESTED: MS

TEST TYPE: POET

	Sequence No.	0402	0402	0405	0503	0506
	Date/Time		2/20 0715			
	Description of Event	nue no.4 1256 ft Hulf Methation	PILE NO.4 ~56ft HALFREEDATION	PILE NO. 4 ~95ft ROLL FEMERATION	PILE NO. 5 ~50ft MALFRANCIBATION	PILE NO. 5 ~ 95ft RUMBERRYTION
	Dial Gages, P(1)			<b>✓</b>	/	<b>V</b>
4	Optical Horizontal Control, P(1)	~	V		~	
ATA	Optical Vertical Control, P(1)	V	/	~	/	/
YD	Tape Extensometer, P(1)	✓	/	/	reference only	V
PRIMARY	Tilt Meters, P(1)	<b>✓</b>			~	
PR						
	Timber Pile Inclinometers, S(9)					
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)		<b>V</b>	/	~	
ATA	Surface Settlement, S(11)	V			/	/
DAI	Ground Inclinometers, S(12)					
	Sondex, S(12)					
SECONDARY	Piezometers, S(13)		/	1	1	
NO	Thermo-couples, S(14)		/	/	1	/
SEC	Strain Gages, S(10)	~			/	
	Record No 02	13			14	15
	Record No 03					

Note: = Complete set of readings taken

ID No.: 09-05-MONOLITH(S) TESTED: MS

TEST TYPE: PDET

	Sequence No.	0600	0603	0606	0703	0706
	Date/Time	Z/Z1 0730	2/21 1130	2/21 1500	2/21 1820	2/21 2300
	Description of Event	PILE NO. 6 START	PILE NO. 6 ~50ft HALFRENETRATION	PILE NO.6 ~95ft FULLIENET PATION	PILE NO. 7 ~524L HALFDENETRATION	PILE NO.7 ~ 95H FXLIENCTEATION
	Dial Gages, P(1)		~	/	V	-
4	Optical Horizontal Control, P(1)	<b>✓</b>				~
ATA	Optical Vertical P(1)	/	~	/	7	/
Y D	Tape Extensometer, P(1)	/	V	ref bases only	refleams only	ref become and
RIMARY	Tilt Meters, P(1)	. 🗸	1			
3	Maria (	13 ₁₄₀				
٩	į,					
	*					
	Timber Pile Inclinometers, S(9)	/				<b>V</b>
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)		V	/	~	/
4	Surface Settlement, S(11)	/	~	/	1	
DAT	Ground Inclinometers, S(12)					<b>V</b>
	Sondex, S(12)					V
DA	Piezometers, S(13)		1	1	~	/
SECONDARY	Thermo-couples, S(14)		~	V	1	~
	Strain Gages, S(10)	1		/	~	~
	Record No 02	16		17	18	19,20,21
	Record No 03					

Note: / = Complete set of readings taken

ID No.: 09-05-

MONOLITH(S) TESTED: MS

TEST TYPE: PDET

	Sequence No.	0706			
	Date/Time	e/ez 0800			
	Description of Event	NO LOADS			
	Dial Gages, P(1)				
4	Optical Horizontal Control, P(1)				
DATA	Optical Vertical Control, P(1)	<b>/</b>			
	Tape Extensometer, P(1)	ref booms only			
AAB	Tilt Meters, P(1)				
PRIMARY					
				-	
	Timber Pile Inclinometers, S(9)	V			
	Timber Pile Slopes, S(9)				
	Tell Tales, S(10)	<b>V</b>			
4	Surface Settlement, S(11)	/			
DATA	Ground Inclinometers, S(12)				
A	Sondex, S(12)				
DA	Piezometers, S(13)				
SECONDARY	Thermo-couples, S(14)				
SEC	Strain Gages, S(10)				
	Record No 02		-		
	Record No 03				

YTE 8.5 Program, 15 - 1

ANA ONE STIR MONTH IN

ID No.: 10-05-

MONOLITH(S) TESTED: M5

TEST TYPE: AXIAL LOAD TEST

	Sequence No.	0000	0000	0002	0003	0004
	Date/Time	2/22/19 2000	2/23 1050	2/23 1600	2/23 2015	2/24 0480
	Description of Event	INITIALIZATION	NOTTAL IZATION	V=240t H= 0	V=4001 H = 0	V= 560t
	Dial Gages, P(1)	1	7	1	1	<b>/</b>
•	Optical Horizontal Control, P(1)	<b>V</b>	/	/	~	~
DATA	Optical Vertical Control, P(1)	<b>V</b>	/	1	V	V
	- Tape Extensometer, P(1)	V	1	/	<b>V</b>	<b>V</b>
PRIMARY	Tilt Meters, P(1)					
	Timber Pile Inclinometers, S(9)			100 A 7 A 7 A 7 A 7 A 7 A 7 A 7 A 7 A 7 A		
	Timber Pile Slopes, S(9)					
	- Tell Tales, S(10)	/	V .	/	~	/
ATA	Surface Settlement, S(11)	<b>V</b>		~	/	V
0	Ground Inclinometers, S(12)					
A	- Sondex, S(12)					
DA	- Piezometers, S(13)	<b>V</b>	~	<b>V</b>	V	/
SECONDARY	- Thermo-couples, S(14)	<b>V</b>	<b>V</b>	/	V	V
SE	Strain Gages, S(10)	<b>/</b>	✓	~	/	~
	Record No 02	BALNICE	4	6,7,8	9,10,11	12,13
	Record No 03					

VM296 Grant Back

MONOLITH(S) TESTED: MS

TEST TYPE: AXIAL LOADTEST

	Sequence No.	0005	0006	0008	0008	0008
	Date/Time	2/24 1600	2/24 2101	2/24 2253		2/25 0030
	Description of Event	V=720t H= 0	V = 760t H = 0	V=560t H=0	V= 267t H= 0	V= 0 H= 0
	Dial Gages, P(1)	✓,				
•	Optical Horizontal Control, P(1)	V				
DATA	Optical Vertical P(1)	/				
	Tape Extensometer, P(1)	V				
PRIMARY	Tilt Meters, P(1)					
PR						
	Timber Pile					
	Inclinometers, S(9) Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	~	/	~	/	
A	Surface Settlement, S(11)	/				
DAT,	Ground Inclinometers, S(12)					
	Sondex, S(12)					
DA	Piezometers, S(13)	~				
SECONDARY	Thermo-couples, S(14)	V		1	1	1
SEC	Strain Gages, S(10)	~	1	~	V	7
	Record No 02	14, 15	16	18	19	20
	Record No 03					

ID No.: 10 - 05 -

MONOLITH(S) TESTED: MS

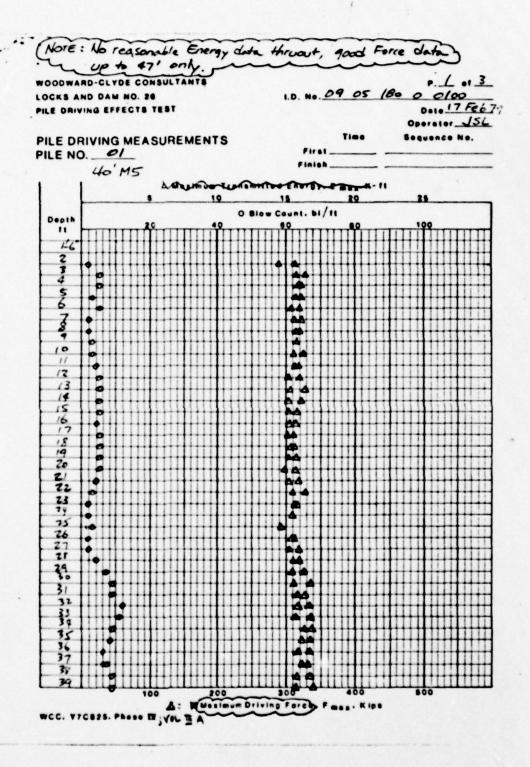
TEST TYPE: AXIAL LOAD TEST

	Sequence No.	0008		
	Date/Time	2/26 08ZO		
	Description of Event			
	Dial Gages, P(1)	E only		
4	Optical Horizontal Control, P(1)	monolith only		
DATA	Optical Vertical Control, P(1)	<b>✓</b>		
	Tape Extensometer, P(1)	/	4-6-	
AAB	Tilt Meters, P(1)			
PRIMARY				
	Timber Pile			
	Inclinometers, S(9)			
	Timber Pile Slopes, S(9)			
	Tell Tales, S(10)	-	 	
ATA	Surface Settlement, S(11) Ground	-		
0	Inclinometers, S(12)			
R	Sondex, S(12)			
SECONDARY	Piezometers, S(13)			
Ö	Thermo-couples, S(14)			
SE	Strain Gages, S(10)			
	Record No 02			
	Record No 03			

Y7C-825 Phase [x; Vol [] A

0.5 COMPLETE DRIVING RECORDS OF PROTOTYPE PILES
DRIVEN WITH IMPACT HAMMER, MONOLITH M5

The driving records are presented in chronological order of driving for prototype piles No. 1 through 7, driven with a VULCAN 010 hammer.



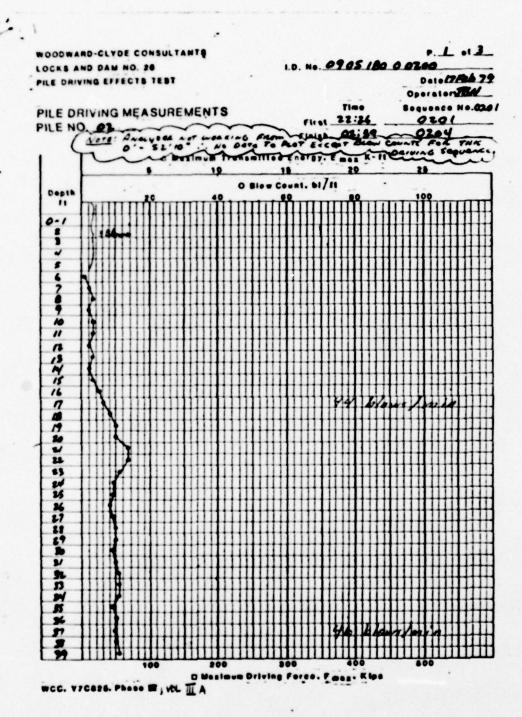
Sequence No. Firet

PILE DRIVING MEASUREMENTS

Finish O Blow Count. 51/11 Depth 45 47 51 55 57 58 WCG. Y7C026. Phono E ,VOL DA

WOODWARD-GLYDE CONSULTANTS 1.0. No.09 05 180 0010 LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST Operator JSL Time Sequence No. PILE DRIVING MEASUREMENTS Firet . PILE NO. 01 Finish. 0 Blow Count. 61/11 Dopth 79 80 \$3 8 99 91 915 96 97 98 99 100 101 102 103

WCG. V7C026. Phase E ; Vol. II A

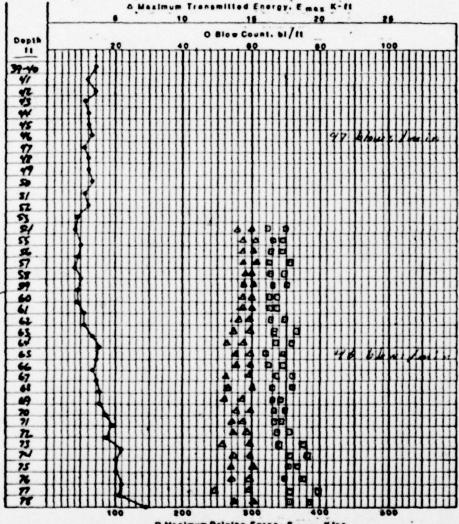


1.D. No. 09 05 180 0 0300 Doi:17/20079

Operator JEN

PILE DRIVING MEASUREMENTS

First 21:34 0201

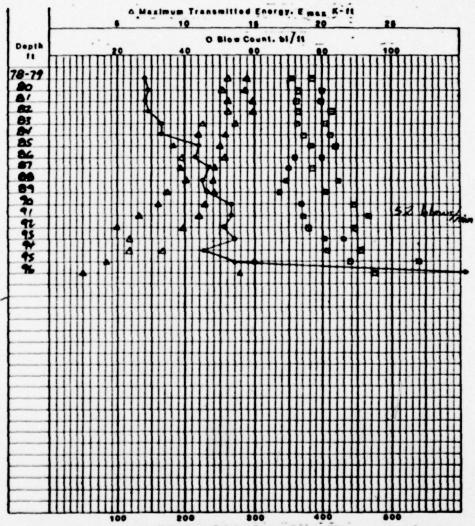


WCG. V7C825. Phone E , VOL II A

1.D. No. 09 05 180 0 08-00

PILE DRIVING MEASUREMENTS

Time Sequence No.
First 22:36 6201
Finish 01:59 0204

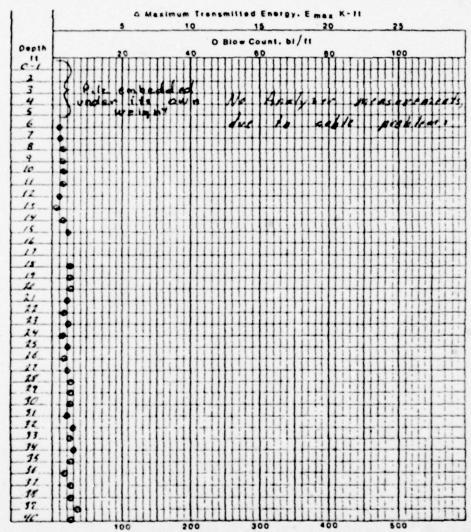


WCC. Y7G826. Phone E , Vol. II A

1.0. No. 09 /05/ 180/0/03

PILE DRIVING MEASUREMENTS PILE NO. __ 07

Sequence No. Time

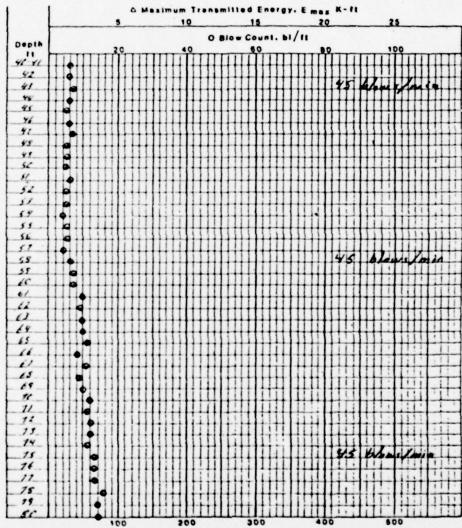


O Maximum Driving Force. F mas. Kips

WCC. YTC825. Phase IT SVOL TO A

1.0. No. 09/05/160/0/0300 Date 2/19/10 Operator ECH

Time Sequence No.



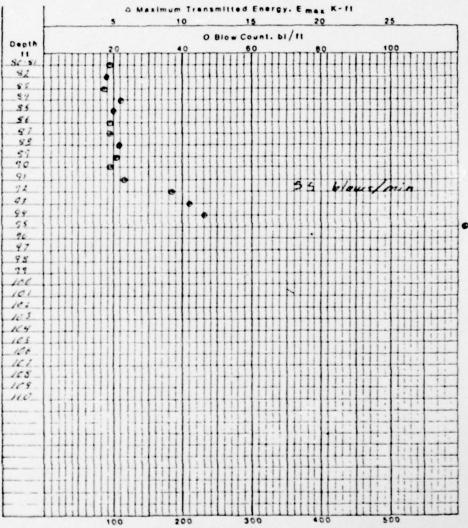
WCC. YTCE25. Phase IZ ; Vol III A

1

1.D. No. 09/05/180/0/050 Operator ECH

PILE DRIVING MEASUREMENTS PILE NO. 03

Sequence No.

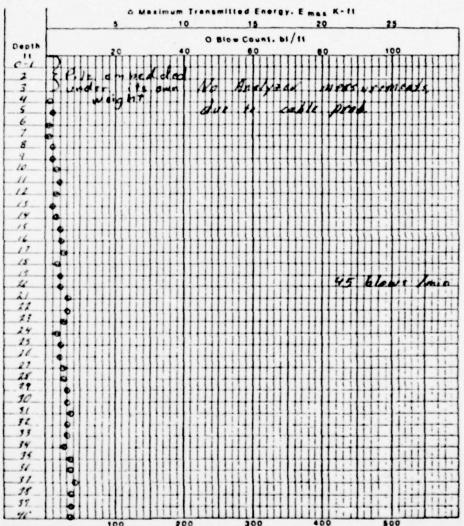


O Marimum Driving Force. F mag. Kips

WCC. YTCBZS. Phase IT : KL II A

1.D. No. 09 105/ 180/ 1/0400 Date 2/20/7 Operator Az

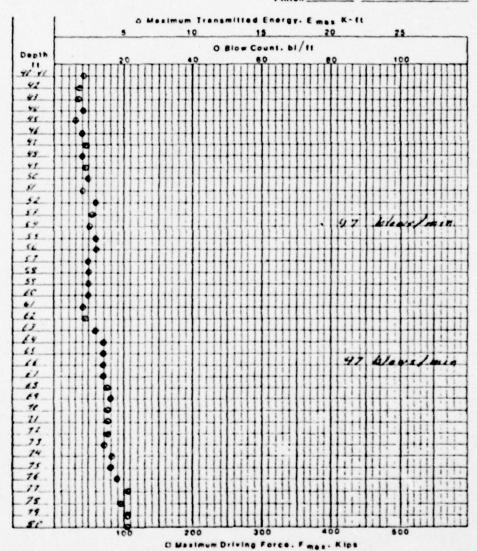
PILE DRIVING MEASUREMENTS PILE NO. ____04_ Time Sequence No.



WCC. Y7C825. Phase IZ : VOL IN A

1.D. No. 09/05/180 /1/0400 Date 1/25/19 Operator At

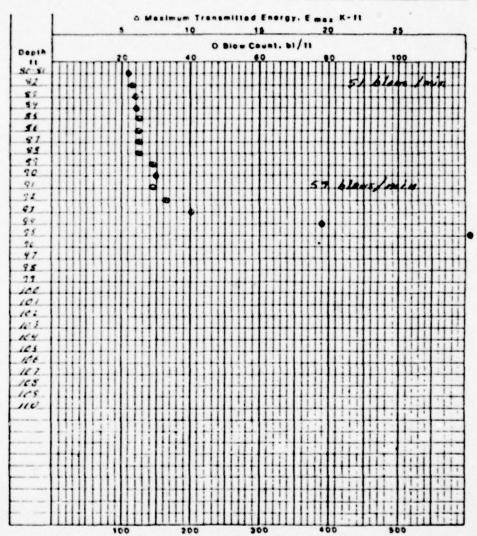
PILE DRIVING MEASUREMENTS PILE NO. 24 Time Sequence No.
First _____



WCC. YTC825. Phase ET VOL ILA

1.0. No. 02/05/ 180/ 1/1400 Date 2/14/19 Operator AT

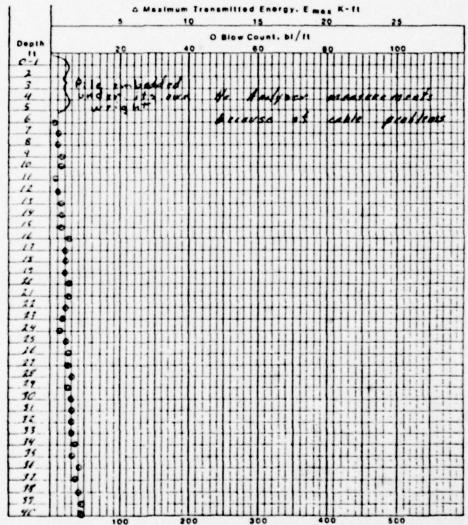
Time Sequence No.



WCC. YTC625. Phase IZ ; VOL ILA

1.0. No. 09 105 1 1801 010500 Doto 2/21

First Sequence No.

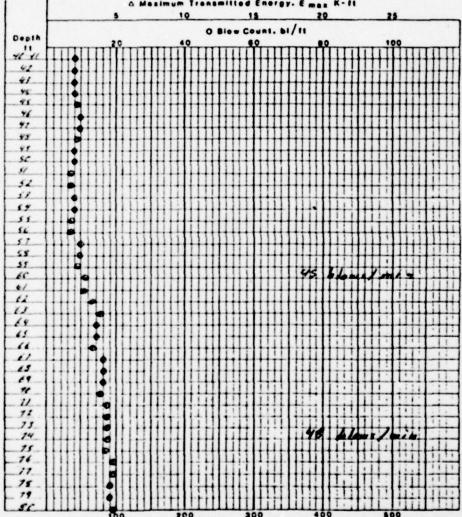


WCC. Y7C825. Phose TI VOL TA

1.D. No. 09 | 65 | 180 | 0 | 1050 C Date 2/11/ Operator AZ

PILE DRIVING MEASUREMENTS
PILE NO. __05_

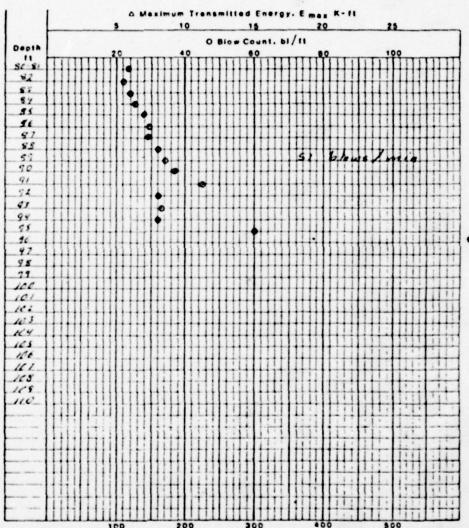
First Sequence No.



WCC. Y7C825. Phase I7 SVOL TA

1.D. No. 09/05/ 180/ 0/05/0 Date 2/2///

PILE DRIVING MEASUREMENTS PILE NO. __05__ Time Sequence No.
First _____



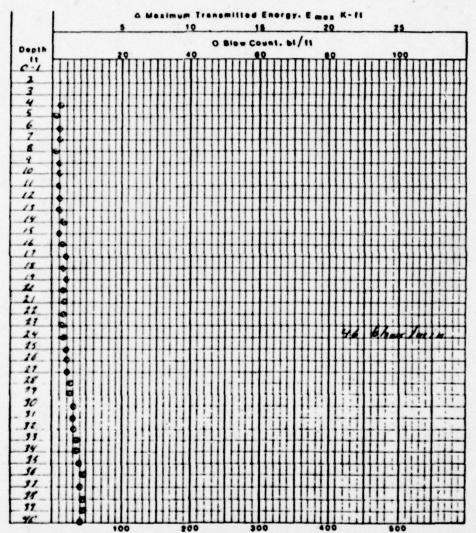
WCC. Y7CB25. Phase IZ jVot I A

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST

P. L 013 1.0. No. 09/05/180/1/0600 Operator DA

PILE DRIVING MEASUREMENTS PILE NO. _01_

Time Sequence No. Finish



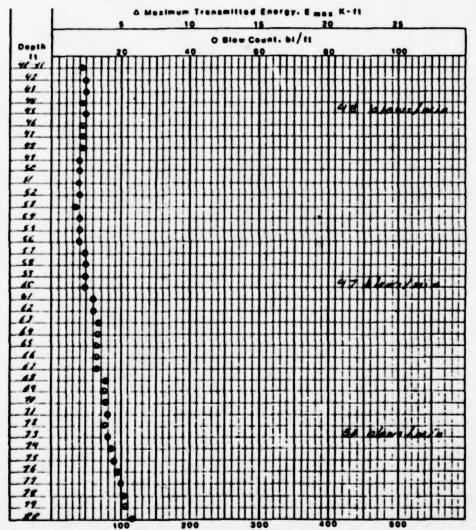
O Maximum Driving Force. Fmas. Kips

WCC. YTCHES. Phose IT IVOL TA

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST

1.0. No. 09/05/180/1/0502

PILE DRIVING MEASUREMENTS PILE NO. _26__



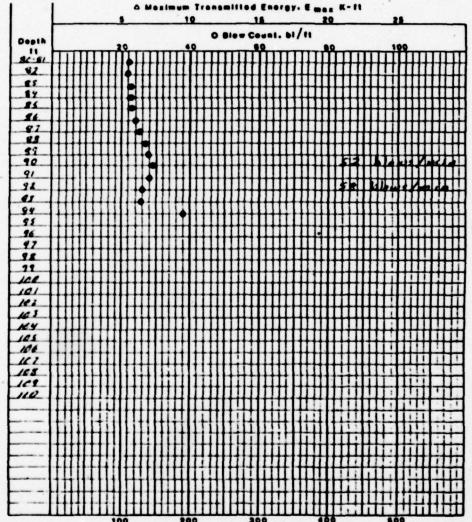
O Mesimum Oriving Force. F mes

WCC. Y7CO25. Photo IZ WOL BA

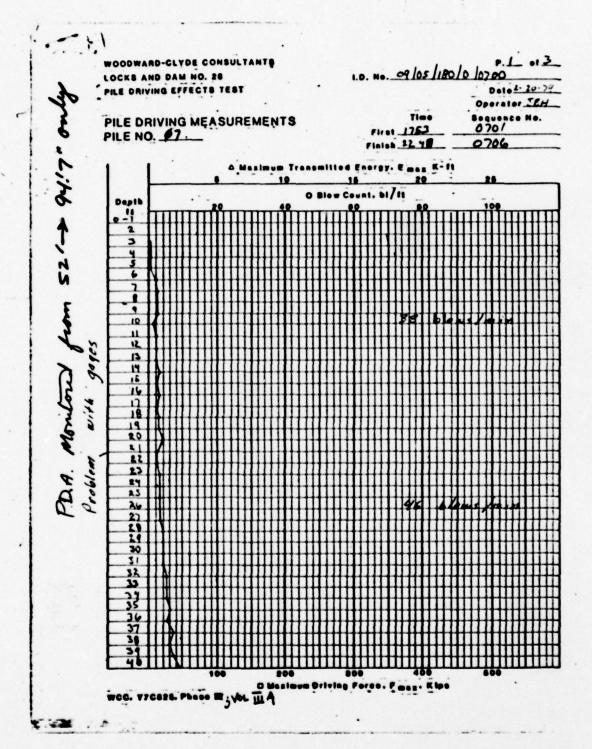
WOODWARD-GLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST 1.0. No. 09/85/180/1/8600 Date 1/2///

PILE DRIVING MEASUREMENTS
PILE NO. ______

Time Sequence No.



WCC. Y7C025. Phoso II ; VOL IIA



4	LOCKS A	RD-GLYDE CONSULTANTS ND DAM NO. 26 ING EFFECTS TEST	1.D. No. 04/05/180	010 2-2019
tom se, -64. 2" and	PILE DE	RIVING MEASUREMENTS	First 1753 Finish 22 48	Operator 184 Sequence No. 0701 0706
36	1 1	A Maximum Transmi	16 20	- 20
1	Dopth			
d	42 43 49			
\$.	45	<b></b>		
7	49		94 42	
13	23 29 23		<b>.</b>	
1	5 1 6 8 5 7		14 46	
P.D.A. M	60			
9.	67 64 65			
	69	<b>7</b>		
	70 71 78 73			
7	75 75 76	76 A Simesing		
	29 21	100 200		
	WCC. Y7	COSS. Phose E ; VOL III A	ving Force, Facg. Ripo	

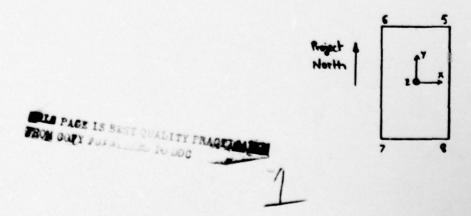
WOODWARD-CLYDE CONSULTANTS 1.0. No. 9/05/10/0/000 LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST Operator 164 Firet 1753 0701 Finish 2248 0706 Depth 97 95 96 87 10 91 12 99 45 18 77 P.O.A. monday WCC. Y7COPS. Phone E SVOL I A

#### 0.6 ABSOLUTE DISPLACEMENTS OF MONOLITH MS

The absolute displacements of monolith during prototype pile driving, presented in Table 0.1 are with restect to the position of monolith, completely unloaded, before prototype pile driving.

The absolute displacements of monolith, presented in Table 0.2 are with respect to initial monolith position before preloading (no load applied); therefore, these displacement values represent total monolith displacements throughout the tests.

					٧.	Compon	eat,in-			
Seq. No. Date/Time	Record No.	Lee	4.1						•	1
of optical survey	of cyber argusition	٧	н				0	ptical 8	TYOY DO	te
		100.0						rrected		
0001	58	123.3	31.7	0 487	0 584	0471	0.41	0.481	-0.070	
2)17 / 08 00	2/17/10:27	101.0	21.5			0.447	0.410		-0.078	
9 17 / 1130	E 17 / 11 15	121.9	31.5	0.530	0.568	0 490	0.456	0.511	-0.010	-0
1.1.10		1000		0542	0.535	0461	0.426	0491	-0031	-0
0104	77	123.3	31.4	0491	0.538		0.500	0.514	-0.080	
5/17/18 45	117 /18.35		21.0	0 486	0 491	0.503	-0 672	0 490	-0 090	-0
05.05	85	124.1	31.9	0 522	0.557	0.561	0.5%5	0.541	-0.100	-0.
2/17 /23:30	2 17 /23:45			0.517	0.535	0.540	0.504	0524	-0107	-0
0004	91,	123.8	31.7	0 567	0.614	0.602	0.571	0.589	-0.160	-0
18 / 03 30	1 18 /03 15			0 545	0.558	0.573	0.538	0.554	-0 160	-0
0300	415	122.1	31.9	0.574	0.525	0593	0:50	0.561	-0.150	-0.
2/19 / 08:00	9/19/10.01			0 550	0.562	0581	0.542	0.559	-0.141	- 0.
0303	49.8	123.3	31.5	0.610	0.646	0 630	0 588	0.619	-0.140	-0
2 10 17 -0	2/19/17 43			0.621	0.619	0 594	0.554	0 517	-0.151	-0
0306	436	122.8	31.5	0.633	0.671	0.659	0.619	0.646	0.180	-0
1 10 /23.00	2/13 /92.16			0 625	0633	0626	0.593	0.620	-0.196	-0
0409	449	183.3	31.5	0.664	0697	0.691	0 648	0.675	-0.180	-0.
2/20 /02:30	2/20/02/17			0642	0646	0 650	0.60%	0.635	-0 199	-0
0401	484	124.1	31.5	2 661	0.701	0676	0 638	0.669	0130-	-0
1/40 /07/5	\$ 150 /07 13			0.554	0 654	0.636	0593	0.634	-0823	-0
24.05	424	123.6	31.5	0 689	0.716	0.705	0.660	0.693		-0.5
4/10 / 11 30	2 90 /11 45			0-670	0 676	0 673	0.630	0 668	-0222	-0.
0503	503	123.3	31.5	0 738	0.744	0.762	0.716	0.731	-0.240	-0
2 90 / 16:30	2/50 /16:24			0692	0 699	0718	0.664	2.693	-0251	-0
2/ 24	5 12	123.1	31.4	0.352	0.852	0 241	0 794	0823	-0.300	-0.
1/91 /51 35	2 1 2 1 2 32			0784	0777	0790	0.745	0.774	-0 319	-0
0600	575	122.6	31.4	0.807	0.328	0 845	0.804	0.822	-0.350	-0.
9 21 /07.30	1 2 2 /07.02			0 775	0.764	0.718	0.762	0.775	-0 326	-0
0603	<b>5°</b> 3	123.6	315	0831	0852	0.879	0.833	0.849	-0.340	-0.
2 51 /11-30	5/51 /11 56			0797	0.788	0831	0791	0.80%	-0 347	-0
2.23	600	123 6	31.5	1.028	1.067	1.051	1-015	1.042	-0.520	-0
1 61 715 20	9 61 /17 01			0 155	0 975	0 995	09-8	0 176	-0 520	-0.0
0703	617	123.3	31.5	1.098	1.123	1.131	1.084	1.109	-0.540	-0.
191/18 20	2 21 /13 17			1.038	1031	1.055	1.008	1033	-0.557	-0.
0706	695	122.6	31.5	1194	1.244	1.251	1.189	1.221	-0.640	
1 1 / 13:00	2 91 /21 53			1146	1.130	1.151	1.099	1.132	-0-676	-0.
2706	635		0.1	0677	0 676	0 665	0 639	0.664	-0.530	-0.
2 19 / 08 00	2 12 03 03			0.650	0.650	0.611	0 594	0.424	-0.608	-0.



0-44				eat, in.	Compon	2-				eat,in.	
Remarks	2	2	78		,		•	•	•		,
								CAPA DO	tical Su	O	
	025	-0.025	0.030	0.040	0,020	-0 080	-0.010	-0.070	0 481	0.41	0471
		-0.042	0.004	0.015	-0 006	-0.028	-0.018	-0.078	0.450	0.410	0.447
		-0.050	0.005	0.010	0.000	-0.105	-0.120	-0.010	0.511	0 456	0 440
		-0.050	-0 003		-0.013	-0.102	-0113	-0.031	0491	0 426	0 461
		-0.040	0.010	0.040		-0.010	-0.100	-0.080	0.514	0.500	0.528
		-0.050	-0 00 3	0.009	-0.015	-0 017	-0.103	-0 090	0 490	-0 672	0.503
		-0.053	0.010	0.020		-0.115	-0.130	-0.100	0.541	0 5%5	0.561
		-0.049	0.019	0.026	0.012	-0.117	-0.127	-0107	0524	0.504	0.540
		-0-090	-0.015	0 000	70.030	-0 165	-0 170	-0.160	0.589	0.571	0.602
,	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	-0.096	-0029	-0.019	-0039	-0.163	-0.166	-0 160	0.554	0.538	0.573
		-0.083	-0.005	0.000	-0.010	-0.160	-0 170	-0.150	0.561	0:50	0593
		-0077	0.000	0.005	-0.005	-0.154	-0167	-0.141	0.559	0.542	0.581
	The same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the sa	-0.086	-0.013	0.005	-0.030	-0.160	-0180	-0.140	0.619	0 588	0 630
		-0.084	-0.010	-0 001	-0018	-0 159	-0.167	-0 151	0.517	0.554	0 594
		-0105	-0.010	-0010	-0.010	-0.200	-0 220	-0.180	0.646	0619	0.659
	111	-0.111	-0.017	-0.015	-0 019	-0.205	-0.213	-0.196	0.620	0 543	0.626
	120	-0.120	-0.020	-0.010	-0.030	-0 220	-0.260	-0.180	0.675	0 648	0 691
		-0118	-0022	-0.017	-0027	-0215	-0231	-0 199	0.635	0.60%	0 650
	30	-0.130	-0.030	-0.010	0 040	-0 230	-0 250	-0 210	0.669	0.638	0676
		-0.133	-0031	-0.013	-0 040	-0 234	-0 245	-0 223	0.634	0 593	0636
	138	-0.132	-0030	-0.020	-0.040	-0.245	-0260	-0.830	0 693	0.660	0.705
	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	-0 131	-0.030	-0 023	-0 037	-0.233	-0 243	-0222	0 662	0.630	0 673
	155	-9.155	-0.050	-0.030	סדס 0-	-0.260	-0 280	-0.240	0.731	0.716	0.762
	Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of the Contract of th	-0.163	-0.055	-0 050	-0.061	-0271	-0284	-0251	2.493	0.664	0 718
	203	-0.203	-0.080	-0050	-0.110	-0.395	-0.350	-0.300	0323	0 794	1580
	189	-0.189	-0.051	-2037	-0.063	-0 357	-0313	-0319	0.774	0.7447	0 790
	255	-0.855	-0.140	-0.080	-0.20	-0.370	-0390	-0.350	0.322	0.804	0 845
		-0 208	-0.075	-0064	-0.087	-0.362	-0358	-0 326	0.775	0.762	0.718
	028	-0.228	-0.080	-0.070	-0.090	-0.375	-0.410	-0.340	0.849	0.833	0.877
		-0217	-0075	-0.062	-0.038	-0.360	-0.573	-0347	0.80%	0741	0.831
	348	-0.348	-0.135	-0.120	-0.150	-0.560	-0.600	-0.520	1.042	1.015	1.051
	334	-0.334	-0187	-0111	-0.144	-0.541	-0562	-0.520	0 176	09.8	0 915
	385	-0.385	-0.165	-0140	-0.190	-0.605	-0.670	-0.540	1.109	1.084	1.131
	351	-0.351	-0.136	-0.110	-0.162	-0.582	-0.607	-0.557	1033	1.008	1.055
	438	-0.438	-0.185	-0.170	-0.200	060	-0.740	0.640	1221	1.189	1.251
	428	-0 428	-0163	-0.147	-0.174	-0.694	-0711	-0 676	1.132	1 0/19	1.151
removal of unal	388 After to	0.388	-0 200	-0 800	-0.200	-0.575	-0.620	-0.530	0.464	0 639	0 665
		-0 400	-0.182	-0.172	-0.192	-0.619	-0.029	-0.608	0.424	0 594	0.411



ABSOLUTE DISPLACEMENTS

OF MONOLITH M5

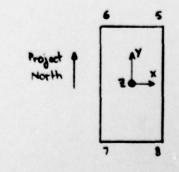
DURING PROTOTYPE PILE DRIVING

FOUNDATION MYESTIGATION AND TEST PROGRAM STRONG LOCAS AND DAW No. 20 OT LOUIS DISTRICT. CORPS OF ENGINEERS.

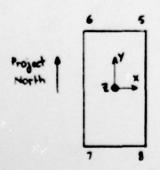
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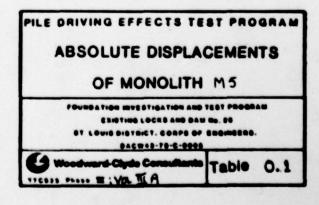
Table O. I

		Hon	zontal di	splacement	,in.		
Displacements	5	6	7	9	Average	5	1
					firence poi	nt data or potention	ole
at the end of preloading (monolith axially and	0.518	0.386	0.390	0 470	0 441	0.105	Section Section
laterally unloaded)	0 468	0.461	0.471	0 462	0.465	0.146	
prior to prototype pile driving (monolith axially and	1.005	0.310	0.861	0.911	0 922	0.175	
laterally loaded )	0.957	0.957	0.318	0.872	0.926	0.224	Andrews and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the Party and the
at the end of prototype pile driving	1.712	1.635	1.641	1.653	1.662	0.745	
(mondith axially and laterally loaded)	1.614	1-591	1.622	1.561	1.597	0.822	and the second
prior to load testing (monolith axially and	1.140	1-036	1.035	1.078	1.072	0.665	
laterally unloaded)	1-118	1-111	1.083	1.056	1.091	0.754	



ol dis	placement	, in.			Settlemen	it, in.			
	9	Awrage	5	6	North Awage	7	8	South A verage	Average
		firence pour ected lines	nt data or potentions	eler dota				****	
90	0 470	0 441	0.105	0 225	0165	0.110	0 035	0.073	0.119
471	0.462	0.465	0.146	0.159	0.153	0.055	0.040	0 047	0 100
861	0.911	0 122	0.175	0.315	0.245	0.090	-0.005	0.043	0.144
318	0.872	0 926	0.224	0 257	0 241	0 061	0.015	0 043	0 142
41	1.653	1.662	0.745	0.965	0.855	0.310	0.205	0.258	0.556
622	1.561	1.597	0 822	0.870	0.846	0 247	0.212	0.230	0.500
35	1.078	1.072	0.665	0.845	0.755	0.310	0.195	0.253	0.504
83	1.056	1.031	0.754	0.788	0.712	0 247	0 212	0 229	0.500





Y7C-825 Phase IV; VOL II A

0.7 INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR PROTOTYPE PILES OF MONOLITH MS

# Monolith M5 Prototype Pile No. 1 Pile Type HP 14x73 Final Pile Penetration 105 ft

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•																
•	FZ		X			X			X			X	1			_
10																
11	F3		×			X			X			×				
18	-															
10	610-1		Y	×		V	Y		V	X		Y	X			
14	613-1		×			X			×			×				
16	G10-15			×			X			X			X			
10	G13-13			X			X			X			X			
17	G10-50			X			IX			×			X			
10	G/3.50															

Prototype Pile No. 2. Pile Type HP 14x73 Funal Pile Penetration 96 ft Monoleth M5

	Be.	0	20	1.		201	L		20		0	20	4	-		
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11	-		_	_		L	_		_	_	_	_	1		_	_
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14	6/3-1		X		_	X			1x			X		_	X	_
**	G10-15			X		_	IX		1	×			1X		_	X
10	6/3-/3			X	_		X		_	IX.			X	THE OWNER OF THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER, THE OWNER	_	×
17	G10-50			X		_	IX.		-	X.	_	_	LX	_		×
10	6/3-50					1							1_			_

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

#### Legend

x all 3 components

x component

y component a component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITH M5 PROTOTYPE PILES No. 1 and 2

### Monolith M5 Prototype Pile No.3 Pile Type HP 14x73 Final Pile Penetration 95ft

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17	G10-50					-	×			X		-	X		-	X			Y			
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Prototype Pile No. 4. Pile Type HP 14x73 Funal Pile Penetration 94.7 ft Monolith M5

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•	MS	_	_	_	_	_			-		1	1_	-	_	1	_
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•••	F3		X	_	_	×	-		X	_	_	×	-	_	×	_
11			-		-	-	-	-	1.7	X	-	-	-		-	-
19	610-1	_	LY.	X	-	Y		-	×		<b>CONTRACTOR</b>		X	_	V	,
14	G13-1		X	_	-	X		-	X	September 1		X	-		1×	-
10	G10-15		-	X.		_	K.	-	-	X.	_	-	X	-	-	X
**	6/3-/3		-	X		-	X.	-		X.	-	-	×		-	X
17	G10-50			X	_	-	1×	-	-	X.		-	X	-	-	×
**	6/3.50		1				1		1	1	1	1	1		1	

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

### Legend

x all 3 components

x component

y component

a component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape

PILE DRIVING EFFECTS TEST PROGRAM INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITH M5 PROTOTYPE PILES No. 3 and 4

TICOTO POSO E : VOL IL A

## Monolith M5 Prototype Pile No.5 Pile Type HP 14x73 Final Pile Penetration 95.25 ft

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•	MZ																											- 1	L
•															ŧ													- 1	I
•	MS																								1			i	T
	FI		×			X			×			X		×			X												T
•																						1						i	T
•	12		×			X			X			X		×			X											1	1
10																													T
11	F3		X			X			X			X		X			X					1							T
10																													
10	610-1		V			V	X		V	X		V	×	1.	X		V	X					- COMPA		1				T
14	6/3-1		×			X			X			X		X			X												
10	G10-15			×			X			X			X		X			X								-			T
10	613-13			X			F			X					×			X											1
17	G10-50									×			×		V			V											T
10	64.50															-	-			_			-	-		-		1	-

Prototype Pile No.6 Pile Type Funal Pile Penetration 94.5 ft Monolith M5 HP 14x73

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PH. P	trelles A		4		,	٠-،			'n.	•	1 5	3'		65				80	)*					
Accessos Bassos	**************************************	8		:	Į.		:	į		:	i.	I	:		I	8	1			1		1.	I	3
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•	MZ						1				1	-	-	1										_
•									-		i													
•	MS						1		1				8	1										
,	FI		X			X	1		X			×			×			X						
•									1															
•	FZ.		×			X			X		i	X			X									
10																								
11	F3		×			×			X			X	1		×			X						
11												-									_	_		L
10	610-1		V	×		V	X		Y	X		V	X.		V	×		Y	JA.		L			
14	G13-1		*			×			×			×			×			X						L
10	G10-15			×			X			×			X			X			IX.					L
10	G13-13			-			X			X			X			X			IX.		1	_		L
17	G10-50			×			X			X			×			×			X		 _		_	L
10	G/3-50																							

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

### Legend

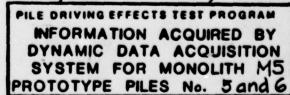
all 3 components

x component

y component component

Stor PVM: Peak Vibration Monitor

Osc.: Oscillograph Tape: Analog Magnetic Tape



# Monolith M5 Prototype Pile No.7 Pile Type HP14x73 Final Pile Penetration 94.6 ft

****	He.	01	10		0	70		0	70	3		70	4	0	705	5		700				•								
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		-		-			-	-			_	-	-		-	_			_	_	-		-					-		-
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•			-									_	1															1	1	1
•	FZ	_	X			X			X				i																	1
10												1	1															1	1	1
11	FS		K			X			X			Y			Y			V											-	1
10	GH	1	_									_	1																	1
19	610-1		V	X			X			×		_	X.			X			×											+
14	613-1		X.			X			×			Y			V			V						-						
10	G10-15			X			E			×			X			X			X										1	
10	G13-13			X			X		-	×			X			×			×											1
17	G10-50			X			X			X			X		,	Y			X											1
10	G/3-50												1																	

Note: Geophones MGI, MG2 and MG3 are represented as MI, M2 and M3.

Legend

x all 3 components

x component

y component component

Stor PVM: Reak Vibration Monitor

Osc.: Oscillograph

Tape : Analog Magnetic Tape

INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR MONOLITH M5

PROTOTYPE PILE No. 7

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Y7C-825 Phase IV; Vol III A

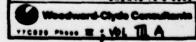
O. & INFORMATION DIGITIZED FROM ANALOG MAGNETIC TAPE FOR MONOLITH M5

Geophone No.	Pro	toty	Digit	i da ti	and the	copt.	9
No.	1	2	3	4	5	6	7
G15-1		50 70 95	\$0			60	51
G13-1		50 70 95	50 70			60	
F2		50 70 95	\$			60	
F3		多为女	50			60	
MGI							58
MG2						$\vdash$	58
M63		$\vdash$					58

Depth of Digitization is the prototype pile tip depth at which the digitized data recorded during the tests on analog magnetic tape, were processed through a computer.

PILE DRIVING EFFECTS TEST PROGRAM
INFORMATION DIGITIZED
FROM ANALOG MAGNETIC TAPE
FOR MONOLITH M5

FOUNDATION INVESTIGATION AND TEST PROGRAM
EXISTING LOCKS AND DAM No. 28
ST LOUIS DISTRICT, CORPS OF ENGINEERS.
BACTICS-75-C-0005



# PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDIX P
MRASUREMENT DETAILS
MONOLITHS M6 AND M7

Y7C825 Phase IV; Vol IIIA

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P MEASUREMENT DETAILS, MONOLITHS MG and M7

P.I COMPLETE FIELD LOG OF INSTALLATION OF TIMBER PILE UNDER MONOLITH MG

The identification number (Id. No.) at the top right-hand corner of the data sheet includes the timber pile number shown in Fig. 5.2, Volume III.

The timber pile number is given by the two digits preceeding the last two geros of the Id. No. (page P-2 corresponds to timber pile No. 25)

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

FDH. 08 06 160 1 2500

Hammer Volcon VI Date 10/22/78

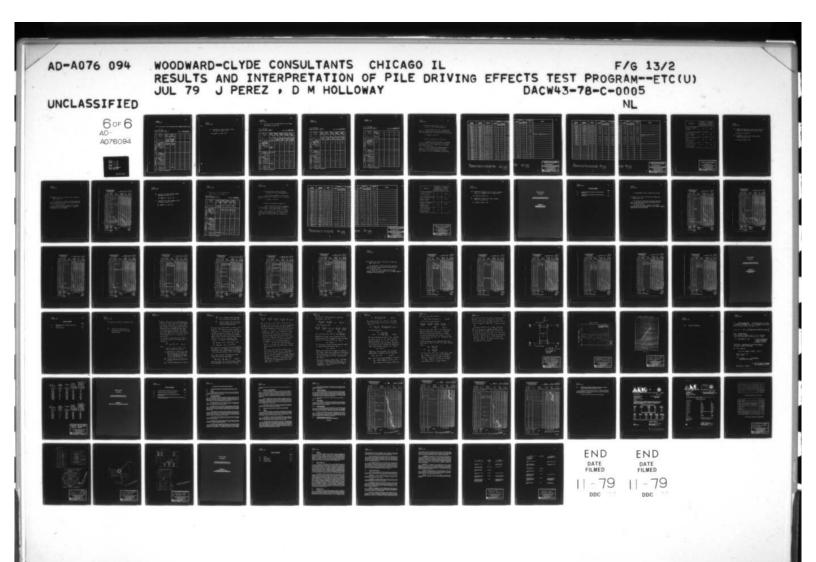
Energy 15,000 fills Time 13/8-14/2
Operating Rate 50 blass/min I go postor - focks / Ted Pile Type Double Fil.
Pile length 42:1
Grand al. Thend Aud 10/21/28

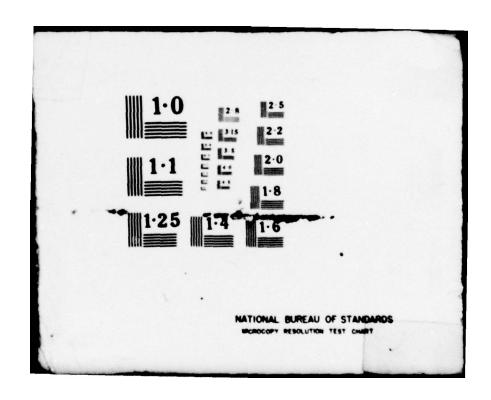
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	<del>                                     </del>	No saw 10 21'	H	TT	Ħ	#	ĦŦ	111	+	11	т	Н	ш	т	Н
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-			010	1	1	11	П	TT	П	TT				П	П

Notes: Note at E.R.D.

WCL, TTCBIS, Thase IF A

1.7% E





YAC-825 DHASE TY; VOL TI A

P.2 SUMMARY LOS OF DATA ACQUIRED DUDING PRELOADING, MONOLITH MG

ID No.:	07-06		
	TH(S) TESTED:	M6	

TEST TYPE: PLEADING

	Sequence No.	0070	0087		
	Date/Time	1/1/1 1130	120/11 040	-	
	Description of Event	306 AXINC OLLANDAL LOADS	BOE ATIME LO NOSE EVILLE 10		
	Diel Gages, P(1)	1	/		
•	Optical Horizontal Control, P(1)	H CEL BOW	" CEL FOR		
DATA	Optical Vertical Control, P(1)				
	Tape Extensometer, P(1)				
PRIMARY	Tilt Meters, P(1)	/			
PR					
	Timber Pile Inclinameters, S(9)			•	
	Timber Pile Slopes, S(9)				
	Tell Tales, S(10)				
•	Surface Settlement, S(11)				
DATA	Ground Inclinameters, S(12)				
	Sondex, S(12)				
V	Piezometers, S(13)				
SECONDARY	Thermo-couples, S(14)				
SEC	Strain Gages, S(10)		/		
	Record No 02		10		
	Record No 03				

Note: / - Complete set of readings taken

YAC-825 Phase Is ; Vol III A

P.3 SUMMARY LOS OF DATA ACQUIRED DURING PILE DRIMING, MONOLITH MG

See Appendix M, Section M.3

Y7C-825 Phase IV; NOL III A

P.4 SUMMARY LOG OF DATA ACQUIRED DURING AXIAL AND LATERAL LOAD TESTINGS, MONOLITH MG

MONOLITH(S) TESTED: M6

TEST TYPE: LOAD TEST

	C N-	10000	0000	0004	22.00	0011
	Sequence No.	0000	2000	0004	0001	0011
	Date/Time	1/9/11	1/9/79	2170	U10/74 0145	D800
	Description of Event	UNIONODO JUNIONE	30¢ AXIAL 2000 LOADS	60t A LIAL BED LABOR LOADS	POE ARINE POE LAMEN LOADS	HOE AKKE ando Landa Landa
	Dial Gages, P(1)	~	/	/	~	
•	Optical Horizontal Control, N RSF P(1)		/		/	/
DATA	Optical Vertical Control, P(1)	/	/	/		
Y	Tape Extensometer, P(1)					
AA	Tilt Meters, P(1)	Beacon				
PRIMARY		7605				(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
٩						
	Timber File Inclinometers, S(9)	Not Power				
	Timber Pile Slopes, S(9)					
	Tell Tales, S(10)	<b>V</b>	/	1	/	/
<	Surface Settlement, S(11)					
DATA	Ground Inclingmeters, S(12)					
7	Sondex, S(12)					
VO	Piezometers, S(13)	/	1	/		/
SECONDARY	Thermo-couples, S(14)					
SEC	Strain Gages, S(10)	NONE +				
	Record No 02			1		
	Record No 03					

Note: / = Complete set of readings taken

YAC-825 Phase 17; vol 11 A

ID No.: 10-06
MONOLITH(S) TESTED: M6

TEST TYPE: LOAD TEST

	Sequence No.	0100	0101	0102	0104	007
	Date/Time	2/0/7	210TA 1520	1750	2010	2300
	Description of Event	30 E ARIAL LOADS	BOL ASIAL UL LATERAL LOADS	30t MINL 9t LANGEL LOADS	30t AKINL 12t LANGEL LOADS	30 & AKIML ISE LANDEAL LOADS
	Dial Gages, P(1)	/	/	/		
*	Optical Horizontal Control, N Car BaP(1)	/	<b>/</b>	<b>V</b>	<b>V</b>	/
DATA	Optical Vertical Control, P(1)	V	/	/		/
	Tape Extensometer, P(1)					
PRIMARY	Tilt Meters, P(1)					
	Timber Pile Inclinometers, S(9) Timber Pile Slopes, S(9)					3
	Tell Tales, S(10)	-	1	V	1	/
<	Surface Settlement, S(11)		-		•	
DATA	Ground Inclinometers, \$(12)					
A Y	Sondex, S(12)		,	,		
SECONDARY	Piezometers, S(13)	/	/	/	/	V
8	Thermo-couples, S(14)					
SE	Strain Gages, S(10)					
	Record No 02					
	Record No 03					

Note: / = Complete set of readings taken

VIC-825 Phose IV; VOL IIA

ID No.: 10-06
MONOLITH(S) TESTED: M6

TEST TYPE: LOAD TEST

	Sequence No.	0110		
	Date/Time	2/12/79		
	Description of Event	FULLY UNLANCED		
	Dial Gages, P(1)	/		
4	Optical Horizontal Control, N CEF 84 P(1)	<b>/</b>		
DATA	Optical Vertical P(1)			
	Tape Extensometer, P(1)			
PRIMARY	Tilt Meters, P(1)			
PRI			<b>+</b>	
	Timber Pile			
	Inclinometers, S(9)			
	Timber Pile Slopes, S(9)			
	Tell Tales, S(10)	/		
4	Surface Settlement, S(11)			
DATA	Ground Inclinometers, S(12)			
7	Sondex, S(12)			
V	Piezameters, S(13)			
SECONDARY	Thermo-couples, S(14)			
SEC	Strain Gages, S(10)			
	Record No 02			
	Record No 03			

Note: / = Complete set of reedings taken

P.S COMPLETE DRIVING RECORDS OF PROTOTYPE PILES DRIVEN WITH IMPACT HAMMERS , MONOLITY MG

The driving records are presented in chronological order of driving for prototype piles No. 1 through 6, driven with a Vulcan 010 hammer and prototype piles Na 7, 8, 13, 14 driven with a MKT DE 70B hammer.

See Appendix M, section M.5

P.6 ABSOLUTE DISPLACEMENTS OF MONOLITH ME

The absolute displacements of monolith during prototype pile driving, presented in Tables P.10 and P.1b, are with respect to the position of monolith, axially loaded and laterally unloaded, before prototype pile driving.

The absolute displacements of monolith, presented in Table P.2, are with respect to initial monolith position before preloading (no load applied); therefore, these displacement values represent total monolith displacements throughout the tests.

0108	382	29.8	5.7
126/20:00	1/26/20 06		
0303		29.9	5.9
127/00:50	1/87/63-09		
0306	459	29.6	5.7
127 13:39	187 13:37		
0403	475	25.8	5.8
1/27/19:15	127/20:21		
0405	481	29.7	5.8
1/28 /07:10	1/28/07:01		
0503	486	30.0	5.8
1 2 9 12:00	1/29 14:30		
0504	494	30.1	56
1/29 /17:00	1/29 /19:25		
0605	507	30.1	5.7
1/30/01:45	1/30/02:12		

Y-Com	Y-Component , in.		
Bottom (1)	Top (1)	Z-Component	Remerks
Cor	rrected Cyber Deta		
0425	0.621	-0.208	
0.431	0.627	-0.184	
0.480	0 687	-0 215	
0 483	0683	-0 255	
0.513	0-127	-0865	
0.525	0.730		No vertical control data Printer inoperable for load level
0.600	0 315	-0.320	
0647	0874	-0.351	
0 687	0.916	-0 363	
0.732	0 951	-0.412	
0 817	1.058	-0.503	
0.843	1037	-0.538	
0945	1.193	-0.623	
1.007	1.270	-0.647	
1.153	1.421	-0.774	
1.061	1.316	-0.810	
1.261	1.528	-0.866	
1.270	1.540	-0.902	
1.362	1652	-0.398	

surface surface



PILE DRIVING EFFECTS TEST PROGRAM ABSOLUTE DISPLACEMENTS OF MONOLITH M6 DURING PROTOTYPE PILE DRIVING

--------07 LOUIS SISTERET, SORPS OF SECRETORS. PACT-19-1-0-000

Table P. 14

103 01:51	29.7	5.7
74 2)03/14:41	30.1	5.7
80 • 103 118.05	30.0	5.7
103/18.05	29.8	5.8
105	30.7	0.0
		•

5.7	2.070	2.267	-1.674	
5.7	1.977	2.255	-1.586	
5.7	2.084	2.409	-1.592	
5.8	2.291	2.615	-1.687	
0.0	1804	2.052	-1.482	After removal of horizontal load
•				

Displacements	Horizontal displacement, in. (measured at 33 in. above ground surface)	33 in. above
at the end of preloading (monolith only laterally unloaded)	0.422	0. £78
(monolith axially and laterally loaded)	1.043 ,	0.486
at the end of prototype pile driving (manolith axially and laterally loaded)	3.037	1. 965
prior to load testing (monolith axially and laterally unloaded)	2.474	1.760

### PILE DRIVING EFFECTS TEST PROGRAM ABSOLUTE DISPLACEMENTS

OF MONOLITH M6

BACW49-70-C-0000

Woodward Clyde Consultante Table P.1 TICOTO PALLE SVOL DA

Y7C-825 Phase IV; WOL ILA

P.7 INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR PROTOTYPE PILES OF MONOLITH MG

see Appendix M, section M.7

P.8 INFORMATION DIGITIZED FROM ANALOG MAGNETIC TAPE FOR MONOLITH MG

see Appendix M, section M.B

YTC-825
Phase Ty; VOL TIA

R9 COMPLETE FIELD LOG OF INSTALLATION OF TIMBER PILE UNDER MONOLITH M7

The identification number (Id No.) at the top hight-hand corner of the data sheet includes the timber pile number shown in Fig. 5.2, Volume III.

The timber pile number is given by the two digits preceeding the last two zeros of the Id. No. (page P-14 corresponds to timber pile No.45)

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PLE DRIVING RECORD

TON. 08 07 160 1 4500

Hommer Value VI Date 10/23/78
Energy 15,000 ff dt Time 13:50-15:47
Openting Rate 60 Blocker Topostor- Lock / Too Pile Type Dough he
Pile length 42.0
Ground al. Trans Shall

Ci Ci	Blows	Remorts	0	D.	73	?			4	+-	-		1	1	E4.			*	4
	-				Ϋ́	П	T	æ	П	T	Ť			m		ñ	П	TT	1
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		Mariana D 21	+		Н	H	+	Н	H	Ħ	+	+	H	н	+	H	H	Ħ	1
		MI MA ID .	н	÷	Н	Н	H	Н	н	H	+	+	+	+++	+	H	H	Ħ	Н
1			Ш	1	4	H	1	ш	н	11	1	Н	4	ш	4	ш	H	н	4
			111	1	4	Н	1	Ш	Н	44	1	1	4	ш	щ	ш	Н	н	4
•			1	1	1	Ц	4	ш	Ц	11	1	4	4	#	4	ш	Н	н	4
3			11	1	Ц.	Ц	Ц	Ш	Ц	ш	1		4	ш	ш	щ	Ц	ш	4
•			Ш	1		Ц	П	Ш	Ц	Ц	Ш		Ц.	Ш	1	Ш	Ц	Ш	4
					ш	Ц	П		Ц	Ц			Ш	Ш		Ш	Ц	Ш	J
-		boute for weekelin				П	П	18	П	П				Ш		П	П	П	J
11			1			П		18	П	11	П		п	П	П	П	П	П	
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19	-		++	-	н	H	-	+	+	H	+		+		+	+	11	Ħ	H
10			-	-	+	-	-	+	+	++	+	-	+	-	+	H	+	+	Н
·		April 45 21-22"	-	_	4	-	-	4	+	++	+	+	+	-	+	+	++	H	Н
	1		Q		4	-	1	4	4	+:	+	1	+	+	4	+	-	+	Н
	<u>+</u>		-	2_	Ц,	1	4	4	1	44	+		+	+	4	4	4	+	Н
21	12		_	_	-	2	-	4	4	Ц	+	_	+	+	+	4	-	+	Н
-11	19		4	_	4	١.,	-	4,	4	4	4	_	4	1	4	4	4	4	Н
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												100 000							

34 1 15

Pile beter of 640.

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WCE, TTE BIS, Phase II A

117.2

Y7C-825 Phase IV; VOLJIA

P.10 SUMMARY LOG OF DATA ACQUIRED DURING PRELOADING, MONOLITH M7

See Appendix N, section N.2

PILE DRIVING, MONOLITH MZ

See Appendix N, section N.3

YTC885 Phax型, Vol II A

P.12 SUMMARY LOG OF DATA ACQUIRED DURING LATERAL LOAD TESTING, MONOLITH MT

ID No.: 10-07-	
MONOLITHIS TESTED	M7

TEST TYPE: LOAD TEST

	Sequence No.	0000	0002	0003	0004	
	Dete/Time	3/10 0500	3/10 0915	20 1310	3/10 1520	
	Description of Event	THEMULIZATION M7	V= 301 H= 61	V = 30t H = 121	V = 30t H = 15t	
	Dial Gages, P(1)	/	<b>V</b>		/	
	Optical Horizontal Control, P(1)	V	not become and y	ref book only	ref beams maky	
DATA	Optical Vertical P(1) Control	/	/	~	V.	
-	- Tape Extensometer, P(1)	~	1	1		
RIMAR	Tilt Meters, P(1)	~	~	/		
ā						
	Timber File Inclinameters, S(9)					
	Timber Pile Slopes, S(0)					
	Tell Tales, S(10)		<b>/</b>			
ATA	-Surface Settlement, S(11)					
3	Ground Inclinameters, S(12)					
>	Sondex, S(12)					
SECONDAR	Piezameters, S(13)		~	~	1	
Š	Thermo-couples, S(14)		/	~	1	
SEC	Strain Gages, S(10)	1	/	-	~	
	Record No 02	BALANCE	6,7,8	2	10	
	Record No 03					

Note: / - Complete set of readings taken

## P. 13 COMPLETE DRIVING RECORDS OF PROTOTYPE PILES DRIVEN WITH IMPACT HAMMER, MONOLITH M7

of driving for prototype piles No. I through 8, driven with a Vulcan 010 hammer.

See Appendix N, section N.5

#### P.14 ABSOLUTE DISPLACEMENTS of MONOLITH M7

The absolute displacements of monolith during prototype pile driving, presented in Table P.3 are with respect to the position of monolith, completely unloaded, before prototype pile driving.

The absolute displacements of monolith, bresented in Table P.4 are with respect to initial monolith position before preloading (no load applied); therefore, these displacement values represent total monolith displacements throughout the tests.

0203	106	30.2	5.8	0.578	1.061
3 03 /08:30	303/0: 46			0.318	1.001
9203	157	30.2	5.9	0.589	1.103
3/03/08:00	15 60 8018				
0301	165	30.3	5.2	0.679	1257
103/14:00	3 03 /16:08		65		
303/18:00	3/03/20 30	38.6	5.7	0.929	1.740
040%	192	30.0	6.0	- 2/0	
3 03 /13 20	3/04/01/37	70.0	-	0.962	1.834
0403	532	29.2	5.9	0.934	
200 200 2016	3/05/09/30			0.134	1.812
0405	549	30,1	5.9	0.982	1.880
3 05/16:30	3/05 /15:57			0.132	1 000
0502	562	30.1	5.9	0979	1.881
3/05/112/00	305/2310			0 111	1.031
0304	570	296	5.8	1.004	1923
306/00 30	3 06 /01 31	30.0			
3/06/08 00	3 06 08 19	30 0	5.1	1.136	2.121
0,04	635	20.0	5.9		
3/06/12:00	300 13 29	7.0		1.888	2.312
0604	648	19.8	5.8	1010	
3/06 /16:00	3/06 /16:49			1.240	2.365
0606	655	30.0	5.8		2.548
3/06/21:00	3 06 122 35				2.348
0703	665	300	5.8	1.536	2.877
3/07/00/30	3 07 101 31	-			
0703	3 07 /09 37	30.0	5.4	1.634	2.966
307/03.00	the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the sa	300			
0 307	307/14:44	30.0	5.1	1.718	3.999

-0.583	
-0.651	
-0 850	
-0.958	
-0.862	
-0.903	
-0883	
-0914	
-1062	
-1.145	
- 1.160	
-1.958	Ainter inoperable
-1.233	
-1.573	

Displacements	Horizontal displacement, in. (measured at 31 in. above ground surface)	7 in. above
at the end of preloading (monolith axially and laterally unloaded)	0.231	0.080
monolith axially and laterally loaded)	1.128	0.547
at the end of prototype pile driving (monolith axially and laterally loaded)	3.460	1.499
prior to lead testing (monolith axially and laterally unloaded)	1.613	

### PILE DRIVING EFFECTS TEST PROGRAM ABSOLUTE DISPLACEMENTS OF MONOLITH M7 POURSATION MYESTIGATION AND TEST PROGRAM ----DAGR48-70-6-0005

(4) Woodward Clyde Consultants Table

Y7C·825 Phase ™; YOL TIA

P.15 INFORMATION ACQUIRED BY DYNAMIC DATA ACQUISITION SYSTEM FOR PROTOTYPE PILES OF MONOLITH M7

see Appendix N, Section N.7

P.16 INFORMATION DIGITIZED FROM ANALOG MAGNETIC TAPE FOR MCNOLITH M7

see Appendix N, Section N.B

## PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDIX Q
MEASUREMENT DETAILS
MONOLITES M4 AND M8

Y7C825 Phase IV; Vol IIIA

Q-ii

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	Page
Complete Field Logs of Installation of Timber Piles Under Monolith M4	Q-1
Complete Field Logs of Installation of Timber Piles Under Monolith M8	0-10
	Monolith M4  Complete Field Logs of Installation of Timber Piles Under

Y7C-825 Phase II; vol IIA

Q MEASUREMENT DETAILS, MONOLITHS M4 and M8

Q.I COMPLETE FIELD LOGS OF INSTALLATION OF TIMBER PILES UNDER MONOLITH M4

The identification number (Id. No.) at the top right-hand corner of each data sheet includes the timber pile number shown in Fig. 5.2, Volume III.

The timber pile number is given by the two digits

Preceeding the last two zeros of the Id. No. (for example, page Q-2 corresponds to timber pile No. 36)

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST 03 04 160 1 3600 PILE DRIVING RECORD Pile Type Drugle Fil. 7 & Grand al. Tand level Vulcan VI 10/24/78 Dote 7:00 - 11:40 16,000 A. Che Energy - gay Loids . openting Rate I'm beiter . Driving Res Depth Remorts Resistance Blows 64 0-1 Pro-jet to 27 dept P. f. send to 14 15 The will 11 13 .. 12 19 10 10 10 14 01 15 20 101 15 JIIII : 111 17 16 23 12 28 37 22 .. 43 20 A-dypt. 47 21 44 . 48 Restrict on 10/15/78 D Capacity Kips MANLE VOL TIA

:

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAW NO. 28 PILE DRIVING EFFECTS TEST

IDN. 03 04 160 1 3500

PILE DRIVING RECORD Pile Type Dongle Fu Pile length 42:1 Vulcan V-24 Oct 78 Dote Hemmer Openting sate 60 Alanton Especial - Local Time 1230 - 1335 Grand al. Treach Level Pringra Resistance - PI) CA Remorts Depth B10-5 0-1 Ale many to 16 1111111111 .. 111111 .. 12 . 4 1 11 13 14 . 7 1111 18 19 Much lignike at 20' 10 11111111 M 11 11 101 19 11 15 101 35 52 24 1101. 1 :1 1 61/H 24 .. 20 Adja . It at 25 for 11 h 21 20 3. 49 play /min 43 .. 24 47 840/ Robert a 10/15/28 at 9:06 lu Departs yes a Capacity Kips PIN ENTE . TELE 0.5% E-

WCC, TTC BIS, Phase II

VOL TIA

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 08 04 160 1 3400

Pile Tipe Beath Fit. Vulcau V-1 Date 24 Oct 78 Time 1340 - 1493 15,000 Energy. Grand at Treach Lovel , opening pate 60 Alas /ma

Depth !	Blows	Remarks	- Rg	1	ig.		-		rije	4-		-	1
			11111	m	-	III	_	11		T	m	TT	1
	1	Po jet to 25	11111	1111	111	111	111	-	111	Ħ	H	11	1
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VOL II A

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

## FON. 08 04 160 T 3300

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WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 20 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 03 04 160 1 3200

Pile Type Double Erell) Hammer Kulcan VII Date 24 Oct 98.

Pile length 42' Energy 15,000 Time 1730 - 1932.

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WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

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WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

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WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

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Y7C-825 Phase IY; YOL II A

Q.2 COMPLETE FIELD LOGS OF INSTALLATION OF TIMBER PILES UNDER MONOLITH M8

The identification number (Id. No.) at the top right-hand corner of each data sheet includes the timber pile number shoum in Fig. 5.2, Volume II.

The timber pile number is given by the two digits

Preceeding the last two zeros of the Id. No. (for example, page Q-11

corresponds to timber pile No. 90)

WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 28 PILE DRIVING EFFECTS TEST Ton. 03 08 160 1 5000 1 PILE DRIVING RECORD 10/22/78 Volcan VI Dote Pik Type 15,000 St . B. 18-15 10 19-10 42 Energy. Pile length 60 Blooking Emperior- Kell / Bein Grand al. Thend Bal . openting pate Blows 64 minni 0-1 Pa jot 10 27 All Ame 10 9 · (Jean) 40 selder brass or 2 [ental) 2 011111 1111 11 10 14 8 13 12 13 12 .. 19 12 10 10 11 13 011 111 24 20 25 26 30 28 38 .. 41 20 41 24 31 41 11 15 for 10. Seprence No. Depth fo BCapacity kips Notes . of strong MCC, TTC BES, Those W; VOL III A

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# PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDIX R
DETAILED ANALYSIS OF
MONOLITH M2

Y7C825 Phase IV; Vol IIIA

R-ii

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R.1	Statistical Assessment of Displacement Data Scatter,	
	Monolith M2	R-1
R.2	Predicted Performance	R-12

MICERS Phase II; Vol IIIA

R DETAILED ANALYSIS OF MONOLITH ME

R.I STATISTICAL ASSESSMENT OF DISPLACEMENT DATA SCATTER, MONOLITH M2 The provision for measuring monolith displacements at four corners of the rigid concrete block affords a redundancy mitable for an anoment of the substitute ocaller in the horizontal (y-direction) and Vertical (y-direction) displacement measurements, in terms of estimated obtained deviation of the data. Simple geometric identities, assuming a rigid concrete block (6ft x 7ft x 13ft), are used to characterize the errors in a given bet of measurements.

The measured horizontal displacement of the

The measured horizontal displacement of the monolith for a given set of reading can be expressed as:

whice:

i = 5,6,7,8 identifies the four corners of the monolith, see fig. A.1;

j = North and routh, represents two nurvey lines (one passing north of the mone-lith, the other passing routh) ward to make theodolite / versier caliper measurements, See fig. R.I;

Yis recorded reading of y-displacement at corner i;

vy: = actual y-displacement at corner i;

Y's = error in alignment of the theodolite the job survey line of - sight; and

Ye = error associated with vernice califered sighting, reading, and heat wave distortions of line of oright.

It may be anumed that all the variable in eq 1, except y;, are independent random variables. furthermore it is assumed that the Y's and Y's variables have zero mean values, and can be approximated by a normal distribution of their value, about the statistical mean having standard deviations Tes and Te, respectively. These statements are represented symbolically by:

 $Y_{i}^{ls}$  independent and  $N(0, T_{ls})$ , and  $Y_{i}^{e}$  independent and  $N(0, T_{e})$ .

These assumption simplify the statistical Calculations made below. Further explanation of the statistical or probabilistic bases of this analysis may be fund in any of several published tests on the subject.

For a rigid monolith, the displacement values satisfy the following relationship:

(y.-y.) - (y, -y.) = 0 (eq 2)

Substituting from eq 1, the error team involving the line of soight can be eliminated, leaving:

It can be shown that  $Y^e \sim N(0, Te)$ . For the optical survey measurements made during prototype file driving at mountill Ma, the values of Ye have been Calculated, and the scatter of these values is shown in Fig. R. 2 vs prototype file number. As described in Section 7.3.4., Volume III, the measurements made during splicing of prototype files (at appearing tely 50ft till hip penetration), are shown an intermediate data points on the corresponding figures. These some officed survey data are plotted on normal probability paper in Fig. R. 3. The fact that these data plot roughly on a straight line supports the assumption of normal distribution for the random variable of normal distribution for the random variable

An estimate of the obtandard desiation Te can be obtained based on the sample standard desiation se of the available data for Y. .

for the optical survey data, the sample standard desiation is Se = 0.016 in. (monelith Me during hoolohype file driving). A comparable analysis of the sample of corrected linear potentionater clata gives se = 0.010 in.

An alternative relationship for the rigid body displacement is given by:

$$\frac{(40+40)}{2} - \frac{(47+40)}{2} = 0 \quad (49.4)$$

Substituting from eq 1:

$$\frac{y_{5}^{a} + y_{6}^{a}}{2} - \frac{y_{7}^{a} + y_{6}^{e}}{2} \cdot y_{N}^{16} - y_{5}^{16} + \frac{y_{6}^{e} + y_{6}^{e}}{2} - \frac{y_{7}^{e} + y_{6}^{e}}{2}$$

$$= Y^{16e} \qquad (eq 5)$$

It can be shown that Y's ~ N(0, \(\sigma \sigma_{16}^2 + \sigma_e^2 .

Evaluating the sample standard desiation for the officed survey data for monolith H2 during problems file during, in terms of Y^{LSE}, one obtains:

Sis = 0.020 in.

The corresponding pample standard deviation bound on corrected linear potentionater data is:

Sis: 0.031 in.

Comparing Ses value and Se value, it is apparent that scatter induced by establishing the line-of-night (setup of theodolite and sighting on survey target) was somewhat operater than that coursed by any other factors.

The monolith displacement data shown in the report were given as the average of the four corner masurements. Thus, the magnitude of horizontal displacement is reported as:

$$\overline{Y} = \frac{Y_5^4 + Y_6^4 + Y_7^4 + Y_6^4}{4}$$
 (196)

By substituting from eq1, the error in the value of \$\forall Qan be expressed in terms of the individual errors as:

It can be shown that:

An estimate of Mandard deviation Tip is therefore Given for the Dample as Sig = 0.016 in. for the officed survey data, and as Sig = 0.022 in. for the corrected linear potentionety data. Discarding one obviously erroneous mading for the totentismeter data, both standard deviations are identical:

Sig = 0.016 in.

following a similar procedure, the mouelith settlement date (3. direction) can be represented as  $Z_i^2 \cdot 3i + Z_i^2$  (199)

Where: Zi = measured value of settlement at corner i;

2: - actual settlement at corner i; and

Zi = random error in reading ~ N(0, Fe)

Assuming rigid body displacement :

or by substituting from equation 1:

$$\frac{Z_{6}^{1}-Z_{5}^{1}}{2}-\frac{Z_{7}^{1}-Z_{6}^{1}}{2}=\frac{Z_{6}^{1}-Z_{5}^{2}}{2}-\frac{Z_{7}^{1}-Z_{6}^{2}}{2}$$

$$=\frac{Z_{6}^{1}-Z_{5}^{2}}{2}-\frac{Z_{7}^{1}-Z_{6}^{2}}{2}$$

$$=\frac{Z_{6}^{1}-Z_{5}^{2}}{2}-\frac{Z_{7}^{1}-Z_{6}^{2}}{2}$$

It can be shown that Ze N N(0, Teg); and, bossed m optical land measurements on monolith. He change probhype fill driving, one obtains an estimate of Teg from Seg = 0.026 in. - For the Corrected fotentionaler data, the corresponding value is Seg = 0.006 in.

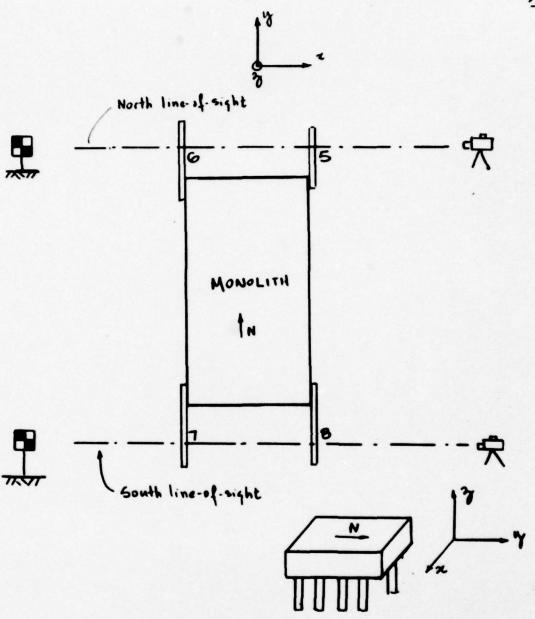
In the report (volume III), the settlements of the north and south ends of the moulilles were given separately. That is,

$$Z_{N}: Z_{s}^{A} + Z_{s}^{A}$$
and
$$Z_{s}: Z_{1}^{A} + Z_{s}^{A}$$

It may be shown that Z; ~ (3; 15%;), where of this standard desiation is given for the optical survey data as 33; = 0.004 in.

In a similar manner, the respective sample standard deviation values were calculated for monolither MI, M3 and M5 during problype tile driving. These values are reputed in Volume II, in Tables 7:3 through 7.6.

The appeal decised herein applies statistical theories to approximate a physical model; however, the results of rouch analyses provide a basis for stimating the magnitude of scatter in the measurements by taking advantage of the redundancy of displacement information obtained during testing. Comidering the testing condition, the degree of scatter achieve is smell and to be expected.



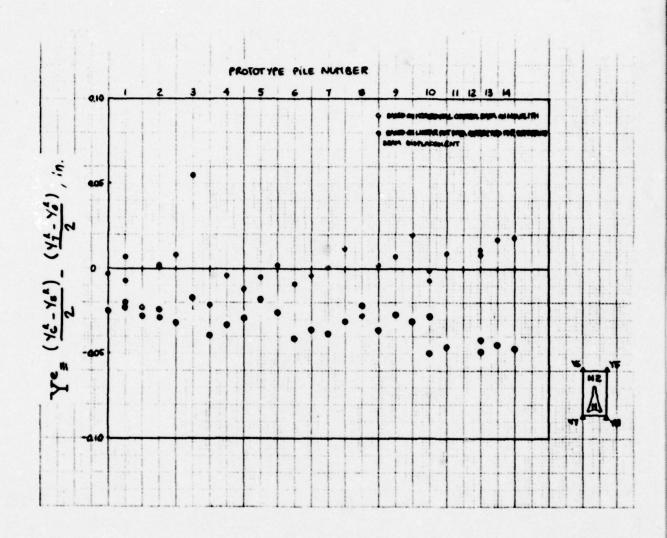
PILE DAIVING EFFECTS TEST PAGRAM SCHEMATIC DIAGRAM OF DURVEY MEASUREMENTS FOR HORIZONTAL DISPLACEMENT

FOUNDATION INVESTIGATION AND TEST PROGRAMS
EXISTING LOCAL AND SAM No. 86
ST LOUIS DISTRICT. CORPS OF GROMESON.

PAGE 10-70-0-0000

Weedward Chris Consultants

Fig. A.1



PILE DRIVING EFFECTS TEST PLYRAM
VARIATIONS OF Y WITH
RESPECT TO READING EVENT

FOUNDATION INVESTIGATION AND TEST PROGRAM
EXISTING LOCKS AND SAM No. 20
ST LOUIS DISTRICT. COMPS OF ENGINEERS.

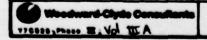
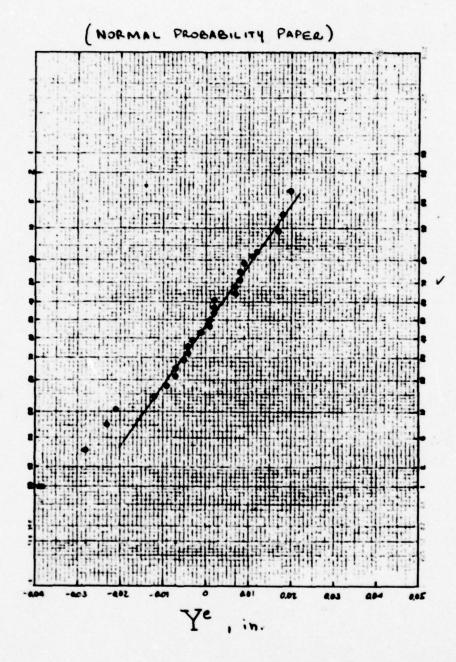
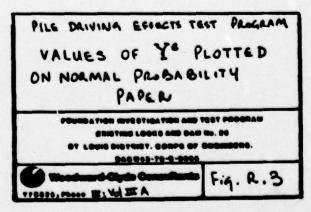


Fig. R.2





Y7C-825 ProjeTi; Vol TA

R2 Predicted PERFORMANCE

R.2.1 Monolith Displacement. The following formula is a result of BARKAN'S attenuation law with Lo's reference velocity relationship applied to FEAGIN'S data from Dam No. 11.

Displacement per B blow = 00046 B (exp(0.488 ln B + 07479) V+ exp(-003(r-1))

R.2.2 Particle velocity.

Particle Velocity normalization for B=10 blow | At was done using Los (1977) equation modified for 14-in. H Piles.

Vi = exp [0.488 ln Bi+ 0.7479]

Vi. Particle velocity (in./s) for any given blowcount.

Bi: Blowcount (blow/ft)

This formula is applicable for a rated hammer energy of 32,500 ft-lb (VULCAN 010 Hammer)

For Bi: 10 blow /fe

Vio = exp [0.488 Ln 10 + 0.7479] = 6.50 in./s

Vio = Particle Velocity normalised for a blowcount of 10 blow/ft

Results shown in Table R.I

Pile Tip Depth Range  ft  5-10 15-20 20-25 25-30 30-35 35-40 40-45	Average Blaucount blow/ft  2.8 2.8 3.4.6 6.4 6.2 6	in./s  0.576 0.487 0.383 0.421 0.418 0.563 0.434	Average Distance r from pile tip to monolith, ft  16.6 22.9 26.8 31.2 35.7 40.3 45.0	Vio in./s /ectorial Particle Velocity measured and normalized for B = 10 blow/ft  1.07 a.91 a.69 a.62 a.52 a.70 a.56
45-50	5.4	0361	48.8	0.49
Pile Tip Depth Range  ft  9-10 19-20	Average Blawcount blow   Pr	Vmeasured in./s a434 a256	Average Distance r from pile tip to monolith, ft  17.6 24.5	Vio, in./s Vertical Particle Velocity Measured and normalized for B = 10 bloodle

0.298

0.341

0.383

0213

30-31

35-36

40-41

50-51

PILE DRIVING EFFECTS TEST PROGRAM
PREDICTED PERFORMANCE
PARTICLE VELOCITY

0,38

0.44

0.49

427

FOURDATION INVESTIGATION AND TEST PROGRAM EXISTING LOCKS AND DAM No. PO ST LOUIS DISTRICT, CORPS OF ENGINEERS.

Weedners Capto Consultanta

33.0

38.5

43.1 52.6

Table R. 1

## PHASE IV REPORT VOLUME IIIA

## RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDIX S
DETAILS OF LOAD TESTED PROTOTYPE PILES

#### TABLE OF CONTENTS

		Page
S.1	Detailed Description of Instrumentation Installation	S-1
S.2	Details of Prototype Pile Calibration Procedures	<b>S-2</b>
S.3	Complete Driving Records of Prototype Piles T1 and T2, Postgrouted Soil	<b>S-2</b>
S.4	Results of Laboratory Testing on Standard Cylinder Grout Samples, Prototype Piles T2 and T4	S-8

#### S DETAILS OF LOAD TESTED PROTOTYPE PILES

#### S.1 DETAILED DESCRIPTION OF INSTRUMENTATION INSTALLATION

#### S.1.1 General

Six prototype piles were laterally load tested: three prototype piles HP 14x73 and three prototype piles PP 14x0.375. Pertinent properties and dimensions are given in Tables S.1a and S.1b, respectively.

#### S.1.2 Strain Gage Installation

Strain gages were mounted at eight levels along the piles, and at the same levels on both types of piles. Four gages were mounted at each level. The gages on the H piles were mounted on the inside of the flanges close to web, but beyond the edge of the roll radius; the gages on the pipe piles were mounted on the outside surface of the piles at 90-degree intervals (see Fig. S.1).

The gages installed on the prototype piles were Micro-Measurements (M-M) CEA-06-125UW-350 (gage factor 2.105+0.3 percent). Each gage was mounted on a steel shim stock with a terminal strip.

The gage location on the piles was first ground smooth, using a grinder with No. 100 abrasive disc. Then, the location was hand rubbed with No. 250 emery paper. To remove any traces of grease and other residues the location was cleaned with ethyl acetate and Instant FD Residue Clearner manufactured by Tech Spray, Amarillo, Texas.

Upon completion of the gage location preparation, the shim stock was welded to the prototype pile with an Ailtech spot welder having an output of 10 watts-second. The next step was to solder the lead wires to the terminal strip. Then, the installation was covered with M-M M-Coat A Polyurethane Coating followed by a layer of butyl rubber (M-M M-Coat FB-2).

After installation of all gages on one side, the lead wires were brought up to the top of the pile. They were fastened to the pile at 2 ft to 3 ft intervals using spot-welded U-brackets.

The cover plate or angle was then placed over the gages and welded into place. Welding was not permitted within 6 in. of the gage to reduce heat and the possibility of sparks damaging the installation.

To further protect the gages, the void under the cover plate or angle was filled with foam-in-place urethane insulation (Insta-Foam Froth Pak Kit, Insta-Foam Products, Joliet, Illinois). The insulation came with the two components separated and under pressure. The components were mixed in a nossle. To inject

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the insulation behind the cover plate or angle, 1/4-in. dia holes were drilled at 5 ft intervals.

#### S.1.3 Inclinometer Casing Installation

A 1.90-in.-id inclinometer casing was installed on the H pile inside a 4x4x1/4-in. angle welded to the pile. The protective angle extended full length to within 5 ft of the top of the pile and was tapered to a point near the tip. An assembled 50 ft length of inclinometer casing was inserted into the protective cover and the grooves were aligned, parallel and perpendicular to the axis of bending. Then, the void was filled with the urethane foam used to protect the strain gages.

Other investigators have installed inclinometer casings on H piles in a similar manner. During driving, their piles deviated considerably from their intended location. This behavior was attributed to the asymmetry of the pile cross section resulting from welding an angle on one side. In an attempt to prevent this from occurring with these H piles, an angle was wleded on the opposite side of the web to maintain symmetry of the section.

The inclinometer casing was installed in the pipe pile after driving and clean-out, just efore grout placement. The casing was held in place with four steel centralizers, the details of which are shown in Fig. S.2.

#### **S.2** DETAILS OF PROTOTYPE PILE CALIBRATION PROCEDURES

#### S.2.1 General

After all instrumentation was installed, each prototype pile was loaded in bending to calibrate the gages. The prototype pile was supported on  $6\pi8$  timber beams resting on wood crib supports about 40 ft apart. Teflon pads (1/8-in. thick) were placed between the prototype pile and the beam to reduce sliding friction during testing. A schematic of the setup is given in Fig. S.3 a.

An Enerpac 25-t capacity, double-acting jack was used to apply the loads to the prototype piles. The jack was activated with an air-operated hydraulic pump. The load applied by the jack was monitored with a 50-t, hollow cylindrical load cell. The load cell was read with a Vishay P-350 strain indicator.

Two prototype piles were calibrated at one time. After placement on the beams, the pipe piles were rotated so that the gages were at a 45-degree angle to the axis of loading. Then, two hoisting straps were chained around the prototype piles, as seen in Fig. S.3a. The positions of the jack and straps were selected to give a moment distribution similar to that expected during actual testing. The maximum load applied during calibration was limited by the strength of the straps. Positions of the jack and straps are given in Fig. S.3b.

The H piles were calibrated in two positions, the jack loading the flange of the prototype pile for both positions. The pipe piles were calibrated in two positions, 180 degrees apart.

#### S.2.2 Calibration Procedures

After the prototype piles and jack were positioned, calibration began. First, the load was cycled from zero to a maximum of three times. The purpose of these cycles was to exercise the gages, as was done with the timber piles. Then, two calibration load cycles were done. Each calibration cycle consisted of loading the piles between 0 and 15 t maximum in six equal increments. The maximum load was sustained for a period of five minutes for each cycle.

Strain gages were read with a Vishay VE-20 strain indicator in a quarter-bridge circuit.

#### S.2.3 Gage Checkout

Upon completion of calibration, the prototype piles were placed in water-filled, cased shafts, so that ground and gage resistances under submerged conditions could be tested. The prototype piles remained in the shafts for one hour before the resistance values were measured.

#### 8.2.4 Strain Gage Bridges

After the calibration of the prototype piles, it was decided that the quarte-bridge circuits should be upgraded to half-bridge circuits. The compelling reason was to provide temperature compensation. In addition, the half-bridge circuit would give twice the output of the quarter-bridge circuit for a given strain.

To make the half-bridge circuit, gages, 180 degrees apart, at the same level were joined, so that one gage would be in compression and the other in tension. The half-bridge circuit was used during the load testing, except on pipe pile T4. The large number of bad gages on that prototype pile necessitated using only quarter-bridge circuits in order to obtain useful data.

## S.3 COMPLETE DRIVING RECORDS OF PROTOTYPE PILES T1 AND T2, POSTGROUTED SOIL

(next page)

#### WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 08 160 1 TO100

Pile Type 11 14 . 73 Hammer 11 10 Date 1/2/12

Pile length = Energy 32 571 4 24 Time 15 18 20 60

Grand el. Total about parting Rate 50 decima Enspector - Dujet 12 20 60

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S-5 P. 2 -4 2 160 1 TO100

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#### WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

TON. 08 72 160 170200

Pile Type PP 14 1 2 Hammer 10 10 Date 12/12

Pile length 55 Energy Time 201 1 2 11/16

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4	10			T	T		П	П		П	11	II	П	П
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38	20	43 Alex Jus	1111	+	11	10	H		Ď	1	+	+	#	#
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#### WOODWARD-CLYDE CONSULTANTS LOCKS AND DAM NO. 26 PILE DRIVING EFFECTS TEST PILE DRIVING RECORD

FON. 08 TZ 160 1T0 200

Pile Type To sail	Hammer Vilor 010	Date 1/2/79
	Energy 32. This les	Time
Growd el. Dent land	. Operating Rate 50 Bit + from	Inspector-Dopal Aggalwal

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Δ.	14	43 Blow / mm	-1::-	113	H	H	H	圤	1	+	++	H	H	H
	15	-3 200 / 100	-+-	117	+	Н	H	÷	5	++	+	H	₩	H
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Y7C825 Phase IV; Vol IIIA

### RESULTS OF LABORATORY TESTING ON STANDARD CYLINDER GROUT SAMPLES, PROTOTYPE PILES T2 AND T4

Standard concrete cylinders were taken of the grout mixtures used to fill prototype piles T2 and T4. They were sent to a commercial laboratory for testing. In addition to compressive strength, the elastic modulus of the specimens from prototype pile T2 was determined.

The laboratory reports are presented in the following pages.





ANCO TESTING LABORATORY, INC. / 1552 SOUTH 7TH, ST. LOUIS, MISSOURI 43184

314-241-0525

Report No. A-151591

Jenuary 6, 1979

Project: Lock and Dan No. 26 Joh No. Y7C325 Alten, Illinois

Moodward Clyde Consultants P. O. Box No. 502 Alton, Illinois 62002

Attention: Nr. Mich Ashley

Contlemen:

We report herewith results of Compressive Strength and Modulus of Elasticity Tests conducted on grout ofx specimens cast in standard  $6^{\circ}$  x  $12^{\circ}$  cylinder milds. The specimens, cast on December 5, 1973, were transported to the laboratory by our representative on December 8, 1973.

#### GROUT HIX COMPRESSIVE STRENGTH TEST DATA

Cylinder Nober	Age at Test-Days	Applied Load-Lbs.	Area Sq.in.	Strength Lbs/Sq. In.
12-6-1	7	48,000	28.27	1698
12-5-2	14	65,000	28,27	2299 016
12-6-3	28	84,900	20,27	2929

#### GROUT MIX WIRELUS OF BLASTICITY TEST DATA

Cylinder Rether	Age at Test-Days	Applied Leed-Lbs.	Strength Lbs/Sq.In.	Unit Strain In Inches	Modelus of Electicity-psi
12-15-4	7	15,200	636	0,000642	100,388
12-15-6	14	21,200	760	0,000612	1,225,490
12-15-6	28	32,800	1160	0.00069	2,038,664

The Middles of Elasticity Stress-Strein Corne is attached and made a part of this report.

Respectfully subsitted.

JTAtek ard Clyde ohn T. Anderson NCD TESTING LABORATORY, BNC.

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lus I anderson



ICOS Corp. FE. 2 . 1979



February 19, 1979

Project- Mississippi River Lock & Daw No. 26 Foundation Investigation and Test Program Contract No. DACM 43-78-8-0083

ANCO TESTING LABORATORY, INC. / 1557 SOUTH 7 A 57 PODE ALESOUR

Report No. A- 152261

ICOS Corporation P. O. Box 583 Alton, Illinois 62002

Attention: Mr. Gregg Sanchez

Gentlemen:

We report herewith results of compressive strength tests made on standard  $6^{\circ}$  x 12° concrete cylinders made by **year** representative.

#### COMPRESSIVE STRENGTH TESTS

Cylinder Number	1	2
Age at Test, Days	•	7
Strength, pol	2370	3059
Total Load, Lbs.	67,000	86,500
Type of Fracture	Regular	Regular
Date Made	02-10-79	02-10-79
Date Received	02-12-79	02-12-79
Date of Tost	62-13-79	02-17-79
Type of Coment	Regular High Early Strangth	Regular
Concrete Mix	Grout	Growt
Addmvo	••••	
Curing	Standard	Standard
Slump, Inches		
Specimen Represents	- Steel Test Pipe Pile -	H

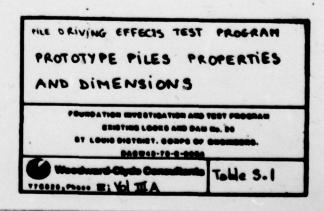
ANCO TESTING LABORATORY, INC.

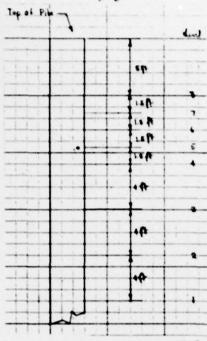
Cross-sectional area of uninstrumented probatypethpile	21.5 in 4
Cross-sectional area of instrumented prototype 4 pile	30.3 in 2
Moment of ireria of uninstrumented protol Ar Hale	734 in4
Moment of inertia of instrumented protolype H pile	882 in*
Elastic modulus	29.4 × 10 8/m2
Length	55 ft

### (a) Prototype H pile properties and dimensions

Outside diameter	14.0 in.
Wall thickness	0.375 in.
Steel area of uninstrumented prototype pipe pile	16.1 in 2
Steel area of instrumented prototype pipe pile	18.9 in ²
Steel modulus	29.4×10 R
Length	55 ft
Concrete area	131.9 in 2
Moment of inertia of uninstrumented prototype pipe pile after concrete placement	1927 in 1
Moment of inertia of instrumented prototype pipe pile prior to concrete placement	459 in 4

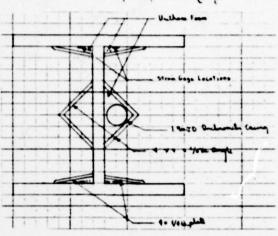
(4) Prototype pipe pile properties and dimensions



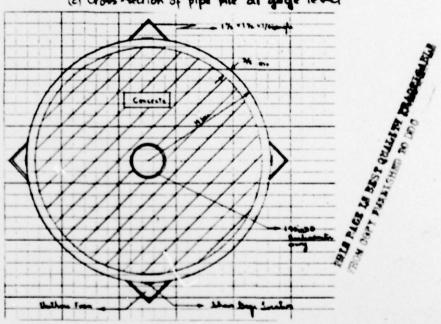


William set or of H pile of gage are

5-12



(c) Cross-section of pipe mile at gage level

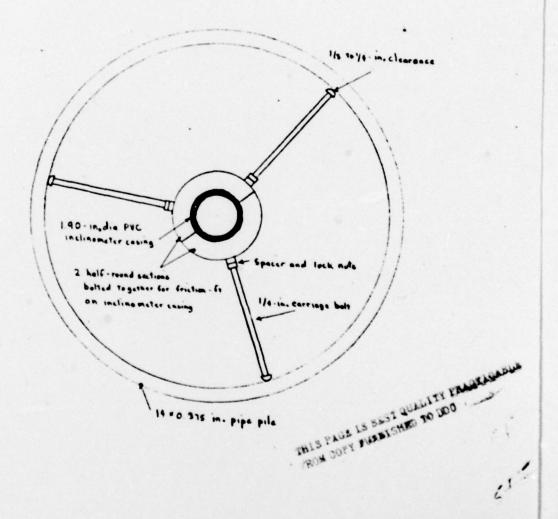


OF PROTOTYPE PHES AT GAGE LEVEL

OURDATION SIVESTIGATION AND TEST PROGRAM
CHISTING LOOKS AND SAM No. 20
ST LOUIS DISTRICT. SORPS OF ENGINEERS.

Weedward Opto Consultante

Fig. S. 1



FILE LAIVING EFFECTS TEST PROGRAM

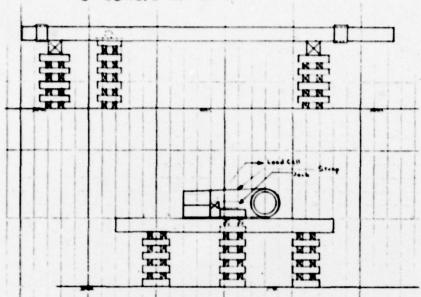
PROTOTYPE PIPE PILE

FOUNDATION INVESTIGATION AND TEST PROGRAM
EXISTING LOCKS AND SAM No. 20
OT LOUIS DISTRICT, COMPS OF ENGINEERS.

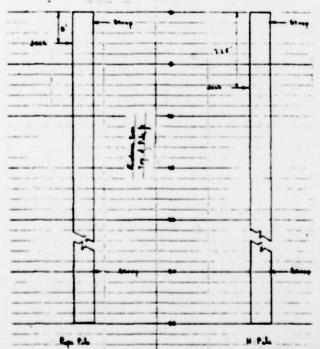
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VICES PRODUCE SANDER

C.g. 5.2



### (b) Jack and straps location



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PILE DRIVING EFFECTS TEST PROGRAM

FOR PROTOTYPE PILES

POUNDATION INVESTIGATION AND TEST PROGRAM EXISTING LOCKS AND DAM No. 20 BY LOUIS DISTRICT, COMPS OF ENGINEERS.

William Cycl Company

Fig . S. 3

# PHASE IV REPORT VOLUME IIIA

RESULTS AND INTERPRETATION OF PILE DRIVING EFFECTS TEST PROGRAM

APPENDEX T
DETAILS OF ANALYSIS OF
MONOLITH-PILE-SOIL LOAD TRANSFER

Y7C825 Phase IV; Vol IIIA T-ii

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		Page
T.1	General	T-1
T.2	Strain Gage Data	T-1
T.3	Geophone Data	T-1
T.4	Computer Programs	T-2

#### T.1 GENERAL

This appendix provides a basic overview of the data processing and analysis procedures used to evaluate the measurement data obtained during the pile driving effects tests. Emphasis is placed on the evaluation procedures for automatically acquired strain gage and geophone data using digital computer systems. The computer programs used in this study are described briefly to highlight the approach taken in the analyses, and delineate the inputs/outputs required for each step. The final section describes the statistical method used to assess the scatter observed in measurements of monolith displacements.

#### T.2 STRADI GAGE DATA

The sequence of operations involved in processing strain gage data obtained by the Cyber II System (Appendix I) is outlined in Table T.1. During online testing, the data were recorded in compact form on the test (floppy) disc using the Cyber program ACQUIRE. These results were translated to a separate disc in a universal character format on the Cyber II. Subsequent steps converted these data into easily accessible form for analyses using Univac 1108 system programs (STX and READTAPE) to generate a permanent storage tape containing complete reading events as separate records. A simple WCC program (STRAINGAGE) is used to read the storage tape and select data from a given reading event for a particular pile, translate the data into card images for input to the analysis program MOMAX³

The program MOMAX employs these card image elements (gage stresses for a particular pile) along with appropriate geometric properties for the individual gages (eg, (x, y) gage coordinates, cross section area and respective moments of inertia), and gage ranks, as inputs to the calculations. A least-square fit of the stressplane at the respective gage level is used to compute axial thrust, bending moment, shear force and orientation of the maximum moment for that level. It should be noted that preliminary MOMAX analyses were performed using raw strain gage data and gage rankings based on calibration data (Section 3.3) in order to evaluate reliability of the individual strain gage readings. In the event that a particular gage reading deviated severely from the "best fit" plane, the gage rank was downgraded accordingly. The final analysis result presented in Section 9.5, Volume III, incorporated these adjusted rankings. MOMAX outputs include printouts of the input data and calculation results, plus plot files of these data for CALCOMP plotting purposes. Descriptions of the computer programs used in this process are given in Section T.4.

#### T.3 GEOPHONE DATA

The basic steps in the processing of geophone records are outlined in Table T.2. As described in Section 3.2.7, Volume III, the dynamic data acquisition system included complete oscillograph records (54 discrete channels), and selected analog magnetic tape records (14 discrete channels). The peak vibration monitors provided elevation of peak vectorial velocities for any four 3-D geophones on-line

during testing plus off-line replay capability from the magnetic tape recording. Manual processing of the peak component and vectorial velocities comprised the major effort expended in examining ground vibration characteristics.

Based on evaluations of these peak velocity data in conjunction with observed monolith displacements selected geophone records were digitized from the analog magnetic tape recordings for subsequent analysis. The digital magnetic tapes were thereafter translated from milivolts to raw velocity time histories for permanent tape storage using Univac 1108 system program STX and TRANSLATE along with WCC program VELOCITY.

The raw (uncorrected) velocity time histories are processed using the WCC program CALIBRATE, which incorporates such corrections as baseline, zero shift,k variations of instrument response for different frequencies, and cutt off high frequency noise, after which corrected velocity, acceleration, and displacement time histories are output for further analyses or plotting. Example response spectra were generated using program SPECTRA and plotted, along with representative time histories for presentation in Section 9.3, Volume III.

#### T.A COMPUTER PROGRAMS

STX. A system program provided by Information Systems Design (ISD), for use on their Univac 1108 computer, to translate Binary Coded Data (BCD from geophone tapes) and ASCII data (from strain gage tapes) to Field data format tapes.

READTAPE. A program using an ISD subroutine to read the Fieldata strain gage tape and write it on a new tape as retrievable card image files for each record (measurement set) from the tape.

TRANSLATE. A program employing an ISD system routine used to read the Fieldata geophone data blocks and write them on new storage tape as card image files identified by title data blocks for retrieval.

STRADGAGE. This program reads the files generated by READTAPE and retrieves card image elements for specified pile measurement in format suitable for analysis using MOMAX. It basically sorts through the stored data to provide input data elements for MOMAX. It is used in a runstream to create elements for processing (MOMAX).

MOMAX. This program calculates bending moment, axial thrust, and shear force for each strain gage level for a specified timber pile/measurement case. Moment and shear are computed in terms of in-plane (y) and transverse (x) components with respect to the y-axis of loading.

The piles are considered "bilinear" elastic in that different moduli may be considered in tension vs compression. Bending moment and thrust for a given strain gage level are obtained by passing a plane based on the least-square fit using weighted stress values (for 4 active gages), or the three stress values (for only

3 active gages) consistent with simple Ewer beam theory. Gages having ranking factors less than three are ignored, and levels having fewer than three gages ranked three or better are completely ignored. The shear force is computed as the slope of the moment distribution curve between two satisfactory gage levels.

CALIBRATE. The program can be used to correct a given time history for instrument response characteristics, cut off high frequencies, baseline correction and zero shift, and to calculate corrected velocity, acceleration and displacement time histories. All these operations, except the zero shift correction, are performed in the frequency domain using Fourrier transformation techniques. The zero correction is done in the time domain. Instrument response characteristics and frequency cut off considerations require assignment of appropriate digital filter parameters.

SPECTRA. The program calculates displacement, relative velocity, pseudo-relative velocity, acceleration, pseudo-acceleration, and acceleration magnification ratio spectral values for discrete single-degree-of-freedom systems (having arbitrary natural periods and damping ratios) and stores these values on a data file for plotting. It is used in a runstream to create elements for processing (SPECTRA) and/or plotting (EQPLOT).

REPLOT. This program reads in a two-dimensional array of data in any format and calls the CALCOMP subroutines necessary to generate (x, y) plot files. It permits generation of data points and/or lines based on arithmetic or logarithmic scales, and labels axes and legends as specified by the user.

EQPLOT. This code is used to plot earthquake time histories (acceleration, velocity, displacement, force and stress) using standard CALCOMP subroutines.

	STEP	PROGRAM	COMMENT
1	Acquire data and store on floppy disc	ACQUIRE (Cyber)	Micro Nova on-line storage
1	Translate stored data to universal format on disc	(Cyber)	From Cyber to ASCE format using Micro Hove off-line
•	Copy data from disc to computer- compatible magnetic digital tape	(Data General Vendor)	Done at remove site (STL)
•	Translate data on tape to system compatible FORTRAN readable tape	STX (Univac Vandor)	
•	Read tape and process into smaller data units on file	READTAPE	Permanent record storage tapes
•	Read file and process into elementa representing each individual pile for a given data set	STRAINGAGE	Format data for input to MOMAX, individually accombin elements
•	Read strain gage data, pile geometry/ property data into program and compute moment, thrust and shear; write output in accomble form for plotting and print out results	MOMAX	Requires external input of pile properpties; plots done selectively with output data sets using CALCOMP coftware

PILE DRIVING EFFECTS TEST PROGRAM
STRAIN GAGE DATA
PROCESSING SEQUENCE

POURS ATION INVESTIGATION AND TEST PROGRAM
ESISTING LOCKS AND DAM No. 20
OT LOWIS DISTRICT, CORPS OF ENGINEERS.

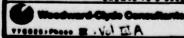


Table T. 1

	STEP	PROGRAM	COMMENT
•	Acquire data and store on:  .a. Oscillograph paper b. \$4 paper tape printout c. FM magnetic tape		Replay mag tape through \$4 to maximize output
L	Manually process oscillograph and \$4 outputs		Tabulate component and vectorial peaks
,	Digitise analog magnetic tape records anto computer-compatible magnetic tape using Biomation unit		Converted ensite, off-line, using selected records
•	Translate digital data on tape to FORTRAN-readible format	STX (Univac Vandor)	
•	Read tape and write each block of data as separately accombin records	TRANSLATE	
•	Read appropriate title block and data block and convert rew data to uncorrected velocity for permanent storage on tape	VBLOCITY	Converts from militroits to in./s
,	Read uncorrected velocity and filtering requirements and convert to corrected velocity, compute acceleration and displacement time histories	CALIBRATE	Carrects for instrument respects variations, cuts off high frequencies, baseline currects, etc., and generates files
•	Compute response spectra from corrected acceleration time histories	SPECTRA	Generates plot files for CALCOMP plot programs

PILE DRIVING EFFECTS TEST PROSERM

GEOPHONE DATA
PROCESSING SEQUENCE

FOUNDATION INVESTIGATION AND TEST PROGRAM
EDISTING LOCAS AND DAM No. 20
OT LOUIS DISTRICT. CORPS OF ENGINEERS.

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Table T.2